



# SOLAR STIK™

MARINE TRANSOM MOUNT  
INSTALLATION, OPERATING  
& OWNER'S MANUAL

## **SOLAR STIK™ MARINE TRANSOM MOUNT INSTALLATION AND OPERATING INSTRUCTIONS**

Congratulations on your purchase of the Solar Stik™. This system is designed to provide many years of reliable DC power. Depending on your power requirements, the Solar Stik™ may act as the primary power generator, or supplement other power generating equipment.

### **TRANSOM MOUNT ASSEMBLY FEATURES:**

\*All construction materials are 304/316 stainless steel and T6061/T5052 aluminum

\*Two 50 watt multi-crystalline solar panels

\*Custom tapered aluminum mast has three axes of rotation for maximum productivity:

axis1: Complete mast assembly rotates 360 degrees at base and locks into desired position

axis2: Panels fold up & down and lock secure when not in use or in heavy weather

axis3: Fully maneuverable solar panel mounts allow for dawn to dusk direct aiming at sun

Creativity is a common element among sailors. Appropriately, with different placement needs inevitable, the Solar Stik™ designers honor such creativity by offering a variety of mounting options. We have designed each Solar Stik™ to be free-standing and entirely rotatable. This full maneuverability is only limited by its placement on your vessel. The transom mount support arms are constructed of T5052, which allows for custom bending if needed to ensure proper installation in a challenging location. Additional bracing or reinforcement may be necessary.

Once a location has been chosen, it is STRONGLY recommended that the Solar Stik™ be professionally installed. A careful and detailed installation of this unit is ABSOLUTELY NECESSARY. If you are not capable of performing a proper installation, please seek professional help at a nearby boatyard or shop of your choice. Please refer to the Dimensional Drawings provided in this manual or at our website ([www.solarstik.com](http://www.solarstik.com)) to assist in determining a proper operating location and installation.

### **SOME BASIC INSTALLATION TOOLS REQUIRED:**

extra person to assist during installation

fine-tip permanent marker

measuring tape

levels (2)

miter-saw with fresh aluminum cutting blade

cordless drill with fresh batteries

1/8", 3/16", 1/4" drill bits

#3 Philips screwdriver

#2 Philips screwdriver

7/16" wrenches (2)

3M 5200 sealant (or similar)

solvent (for sealant clean-up and marker removal)

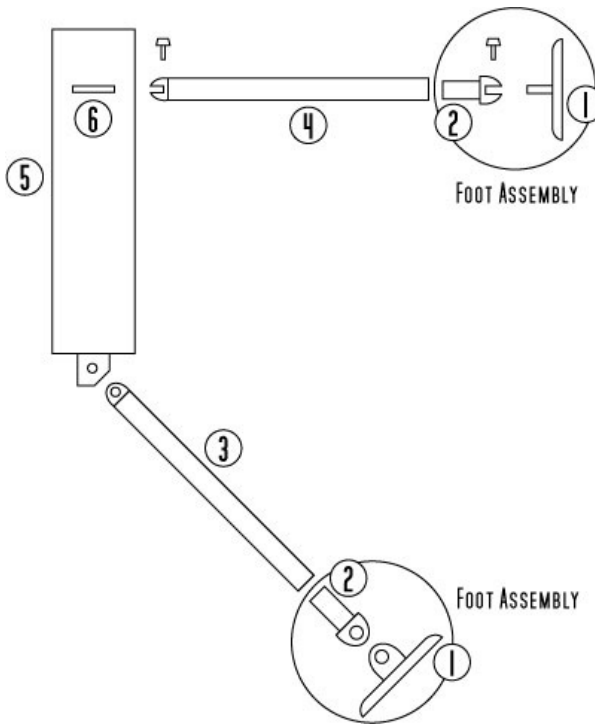
supplied hardware: Backing plates

Through-bolts, locknuts and washers

Tapping screws

Ear to Support Arm socket cap screws and Delrin Washers

hardware NOT supplied: Transom Thru-bolting hardware



1. foot
2. pins
3. lower support arm 30"(max.)
4. upper support arm 36" (max.)
5. socket and locking handle
6. mounting ears

7. Backing plates



**INSTRUCTION OVERVIEW:**

**READ ALL INSTRUCTIONS BEFORE BEGINNING ANY ASPECT OF THE INSTALLATION!!** Great time and care have been taken to ensure that the reader of these instructions understands every detail of the installation process. The Solar Stik™ represents a serious investment. Installed improperly, the investment can be significantly diminished. The installation of the Solar Stik™ assembly should take about 3-4 hours to complete unless special bending/welding of the support arms is necessary. Wiring may also require additional time.

Before any installation work is performed, the boat stern should be fully accessible and the vessel be level fore, aft, and abeam. Ideally, the boat should be out of the water in a proper marina facility. The levelness of the boat is critical for proper installation of the transom mount. Use the vessel's vertical attributes such as the mast, stanchions or rails for additional visual reference. The mounting location of the Solar Stik™ is extremely important for optimal operation. The following should be considered when determining mounting location:

1. height of solar panel arm assemblies when fully deployed (90 degrees to pole)
2. rotating ability with solar panel arms deployed (minimal mast rotation of 180 degrees)
3. freedom of movement in raising and lowering of solar panels
4. panel tilting of at least 60 degrees when solar panel arm assemblies are fully deployed
5. the addition of a light-duty lifting crane to the Solar Stik™ and its operation

These factors are critical for full operative ability. Please consider things such as back-stays, canvas

structures, fishing-rod holders nearby, and physical accessibility to the solar panel arms for manual deployment and adjustment. The best method to follow when installing your Solar Stik™ is to FIRST determine where the mast and panel assemblies need to be located, and THEN install the transom mount to the location supporting the desired Solar Stik™ location.

Although the installation of the transom mount allows for some minor corrections during the process, every caution should be taken to avoid removing too much material when cutting the support arms. When matching the support arms and feet to the vessel's shape at the stern, three axes are being used to determine where and how each arm is connected to the corresponding foot assembly. For simplicity, we will refer to each axis as an angle. Most of the angles must be manipulated by the installer to achieve the proper orientation.

**First Angle:** the swing angle of the upper and lower support arms from the transom mount to the stern. (NOTE: the lower support arm swing angle is designed for only 45 degrees of adjustment. If a custom bend is required to achieve proper orientation, ONLY the upper support arms may be bent. NEVER BEND THE LOWER SUPPORT ARM.)

**Second angle:** the pitch of the vessel's stern laterally (right to left) and the necessary pitch of the support arm's foot & pin assembly.

**Third angle:** the pitch of the vessel's stern longitudinally (up and down) and the necessary pitch of the support arm's foot & pin assembly.

Each foot & pin assembly can be adjusted to meet the angle of the stern by rotating the entire assembly when the pin is inserted into the corresponding arm, and adjusting the foot at the joint where it meets the pin. Once the proper orientation of the foot & pin assemblies are achieved, the arms are then thru-drilled twice at perpendicular angles where the pin assembly is inserted; two supplied stainless steel 1/4" bolts are then inserted. The transom mount's foot assemblies MUST BE BOLTED THROUGH THE STERN USING SUPPLIED BACKING PLATES.

Reinforcement of the stern or bracing of the transom mount support arms may be necessary if the stern material at the installation location is thin or flexes. **Solar Stik™ Marine Bracing Kits** are available for purchase at an additional cost and will help strengthen the transom mount installation in the event of a weak stern. The transom mount will also accept custom bracing including additional welding if a **Solar Stik™ Marine Bracing Kit** is not suitable. See page 32 at the end of this manual for information regarding the **Solar Stik™ Bracing Kit**.

Since not all transoms are the same, some modifications of the support arms may be necessary. If bending or welding of the support arms is necessary, this should ONLY be done by a metal fabrication shop or professional with the correct tools. Failure to use proper procedures in bending or welding aluminum could result in an unsafe installation.

If a total custom installation is necessary, the Deck Mount Kit may be preferred. This kit consists of a 24" mast-locking socket and trim-ring for the Solar Stik™. This type of installation is ONLY to be performed by a professional. Deck mounting ("above-deck" or "through-the-deck") requires custom supports and bracing above or below deck surface. All areas surrounding the installation of the Solar Stik must be strong and free of rot. Please visit [www.solarstik.com](http://www.solarstik.com) for more information about the Deck Mount Kit.

**TRANSOM MOUNTING:**

First, make sure that the boat is level (VERY IMPORTANT) at all points. The installation begins with the lower arm of the Transom Mount Kit.

***NOTE: The lower arm is capable of an adjustment angle of only 45 degrees. Therefore, the final length and angle of the lower arm affects two other measurements: the Solar Stik™ overall height and clearance from the stern. It is critical to mount the lower arm exactly correct, so great care should be exercised in this part of the installation process.***

Once it is determined where the Solar Stik™ mast assembly should be in relation to the stern, hold the transom mount socket assembly at desired location with only the lower support arm attached. Determine the necessary angle and amount of the lower support arm that needs to be removed. (See Fig. 1)

(Fig. 1)



(TIP: This part may be best achieved with multiple, progressive cuts of the lower support arm. Be sure to accommodate for the height of the solar panels when deployed.)

The lower support arm angle is designed to be set manually. The female pin on the lower support arm is pre-drilled for a 1/4" clevis pin, but the ear on the underside of the socket is not. Once the correct angle is chosen, the installer should hold the arm in place and drill through the ear using the 1/4" clevis pin hole as a guide. Insert the 1/4" clevis pin to lock the arm into the desired angle. (See Fig. 2)



(Fig. 2)

Once the correct foot assembly location is determined, mark where the foot pad is to be attached to the stern by tracing a circle around the pad with a permanent marker. Mark every hole where the pad will be thru-bolted. At this time, you should check and make sure that drilling through the area marked for the foot is strong and free of wiring, fuel lines, or other potential hazards. Exactly in the center of one of the hole marks where the stern thru-bolts will be, carefully drill a shallow 1/8" diameter hole. If possible, **DO NOT DRILL ALL THE WAY THROUGH**. Use one of the short, self tapping screws included in the hardware to temporarily attach the lower arm foot assembly to the stern and hand tighten it into place (this will allow you to further test the location with a temporary 'support arm'-to-'foot assembly' attachment). (See Fig. 3)

(Fig.3)



With the first foot assembly temporarily held in place by the screw, place the transom mount lower arm onto the foot assembly, sliding the pin fitting into the end of the arm. **Re-check the height and stern clearance again at this time.** Resting on the lower foot assembly, have an assistant hold the transom mount as close to vertical as possible (use level) while you ensure the transom mount is in the desired location. (See Fig. 4) Hold the transom mount upper support arms in place to get an idea of the angles and where the upper support arm foot assemblies will attach to the hull. Also, look for any obstructions (wires, fuel lines...etc.) in the areas where the upper support arm foot assemblies will be located.

(Fig. 4)



Once you are certain that the location of the transom mount is correct, proceed with this installation. If it is determined that the location will NOT work, then remove the single screw that holds the lower support arm foot assembly, make the necessary adjustments or relocation using the same procedures, and continue.

Completely remove the lower support arm foot assembly from the stern. Using the 3/16" bit, partially drill the remaining three marked holes and install the foot assembly with the supplied temporary screws. Have your assistant hold the transom mount in place again with lower arm resting on the foot & pin assembly.

Use a level gauge to ensure the socket for the Solar Stik™ is vertical. Once level, mark across the joint between the support arm and pin with a permanent marker. This reference mark will aid in keeping the mount in its optimal position. (See Fig 5.)

(Fig. 5)



Begin the installation of the upper support arms one at a time. Measure the upper support arm length (and determine the bend angle if necessary) to meet the desired foot assembly location, and cut (or bend if necessary) the arm to fit. Remember to set the proper pitch by rotating the foot & pin assembly to match the stern. Follow the same procedures as earlier when performing a temporary mounting, making sure to mark the location of the pad and holes on the stern. (See Fig. 6 for examples of custom bends on the support arms.)



(Fig. 6)

Once all three feet are temporarily screwed in place and ready for final thru-bolting, it is time to thru-drill the arm and pin assemblies. Using your marker, write numbers directly onto the arms and feet that correspond to the support arms to their respective foot assemblies (for example: arm #1 and foot assembly #1). Make sure that the foot assemblies are screwed snugly to the stern and the transom mount is in its correct position. On the upper support arms, draw lines across the joint where the arm meets the foot assembly pin. This will give you a visual reference to ensure the proper alignment of the pin to the support arm. (Refer back to Fig. 5)

Prepare the cordless drill with a 1/4" drill bit. At the joint of the lower support arm and the pin, measure 3/4" up the arm, away from the joint, and mark it. This location is where you will drill through the arm and pin, and install a thru-bolt. Keep in mind that each support arm and pin assembly will ultimately need 2 thru-bolts placed perpendicular to one another, and 3/4" apart. At this point of the installation, you will only be drilling and installing one thru-bolt per arm and pin assembly. Repeat the process for the upper arm and pin assemblies.

(Fig. 6)



Once all the arm and pin assemblies have been thru-bolted once, unscrew the foot pads from the transom and remove the entire transom mount assembly. Mark 3/4" further up from the installed thru-bolts, and choose an angle to thru-drill that is perpendicular to the first thru-bolts on each arm. Drill and thru-bolt. This completes the installation of the foot assemblies to the support arms. (see Fig. 7)

(Fig. 7)



Using the 1/4" drill bit, proceed with drilling through the transom temporary screw holes. It is recommended that another "test fitting" take place one final time. Have your assistant hold the transom mount in place while you put the 1/4" thru-bolts through the stern. Test fit the backing plates on the inside of the stern where the transom mount hardware protrude inward. The foot assemblies should match the shape and contour of your vessel's stern and the socket for the Solar Stik™ should be vertically level. If all fits well, then the transom mount is ready for final installation.

Use a reputable marine grade sealant to install the footpads against the stern. We recommend 3M's 5200. The thru-bolt hardware should be hand tightened at the backing plate, having your assistant hold the external heads in place. Once the backing plates are installed and tightened, the extra length of the thru-bolt hardware can be cut away.

You have now completed the installation of the Transom Mount for the Solar Stik™. (See Fig. 8)



(Fig. 8)

**ELECTRICAL CONNECTION:**

Please consult a wire sizing gauge to determine proper length and size of the wiring from the vessel electrical system to the Solar Stik™ twist lock plug. Connection to the plug is as follows:

Terminal #1 yellow = common DC negative ground (for solar and wind generator/accessory)

Terminal # 2 unused = wind generator or accessory (not included) DC positive \*\*

Terminal # 3 red = solar panel DC positive

\*\* If the supplied MPPT control is used for the Solar Stik™, the DC ground for the solar panels MAY NOT be used as the ground for the accessory. (See Solar Boost™ 2000E manual for additional wiring instructions and details.)

Additional wiring receptacles for accessories may be installed on the mounting plate under the existing Solar Stik™ connection receptacle.

Any extra wiring for GPS, radio, or TV must be supplied by the installer.

**INSTALLATION OF SOLAR STIK™ INTO MOUNT:**

Once the transom mount is secure to the vessel, the mast assembly should be FULLY inserted into the socket. The bearing plate in the bottom of the mast should be in full contact at all times with the base of the socket. Tighten the mast locking handle to ensure the mast does not swivel during solar panel arm attachment. (See Fig. 9)

(Fig. 9)



**CAUTION: THE SOLAR PANELS CONTAIN TEMPERED GLASS . EXERCISE CAUTION WHEN HANDLING THEM.** If you are installing during daylight, your solar panels will be producing electricity. Do not let the leads from the solar panels short-circuit.

**SET-UP TIP:** To ease the setup process, the Solar Stik™ was designed to be assembled from one side. After the mast assembly is placed upright into the base, rotate it until the aluminum handle is facing you. This is the "front" of the system. The solar panels have a "front" side as well, and there is a small "front" placard located on one side of the solar panel frame. This placard indicates the side that should be facing you during the assembly of the panel arms to the mast. (See Fig. 10)



(Fig. 10)

Lift and attach each solar panel arm to the mast at the hinge pin location. Simply remove the quick-release T-handle pin from the female hinge section, insert solar panel arm male hinge section, and re-insert the T-handle pin. Allow the solar panels to hang down against the mast. Attach the sliding clamp assembly on each solar panel lifting arm to the support arm by placing the clamp stud handle through the end of the arm support. Do not tighten the clamp fully as it will not allow you to raise the panel. Connect the solar panel female plug to the male plug on the Solar Stik™ to complete electrical connection (See Fig. 11, NOTE: the plugs are polarized and will only connect together in correct polarity. If you have difficulty, re-orient the plugs and try again). Repeat this process for the other solar panel. The Solar Stik™ is now fully assembled and ready for operation. (See Fig. 12)

(Fig. 11)



(Fig. 12)



**SOLAR STIK™ OPERATION:**

Located on the outer ends of the solar panel arms is a round aluminum handle. **This handle should remain tightened at all times. Check to be sure that it is tight by rotating it clockwise.** (See Fig. 13A)



(Fig. 13A)



(Fig. 13B)

Lift the solar panel arms until they are perpendicular to the main mast assembly, then set the support arm by tightening the slide clamp on the underside of the panel frame. (See Fig. 13B) The solar panel inclination can now be set. Loosen the transom mount locking handle and rotate entire mast assembly into desired position and re-tighten. Tilt the panels into direct sunlight. Once panel orientation is set, tighten all handles to ensure position and safety. (See Fig. 14)



(Fig. 14)



(Fig. 15)

Finally, plug in the vessel's electrical system plug to the Solar Stik™. That's it! You are now producing DC power! (See Fig. 15, NOTE: it is not necessary to plug and unplug in a regular basis. The plug can remain attached to the receptacle on the Solar Stik™ unless the entire Solar Stik™ system is being removed.)

**SET-UP TIP:** The mechanical connection of the solar panel arm to the mast is designed as a tight fit. As a result of the close tolerances, some people may experience minor difficulty during the process of installing the panel arms to the mast. When holding the panel arm, it is a good practice to grasp the panel in a location that will allow the panel to hang straight down. This will aid in placing the panel arm's male pin into the slot.

In the Fig. 10 photos, note the location of the operator's hand when holding the solar panel arms. This location ensures that the panel will hang straight down and insert more easily into the mast connection.

Additionally, a light lubricant on this connection is recommended to help with proper positioning and pin insertion.

All rotating handles on the Solar Stik™ can be mechanically disengaged in order to rotate the handle into a more favorable position for leverage. Simply pull the handle arm up, rotate, and release back into place.

#### **INCLEMENT WEATHER:**

The Solar Stik™ was designed for the harsh marine environment and is fully weatherproof; However, some caution should be exercised when high wind conditions exist. The solar panels should be folded down and locked against the mast using the 2 rubber draw latches. If sustained winds higher than 50 miles per hour are expected, remove the solar panels and store them in a safe environment.

#### **LOW LIGHT CONDITIONS:**

There is a simple rule to remember about the ability of the Solar Stik™ to generate power. If there is any light (even faint light during dawn or dusk), the solar panels are producing power. In low light conditions, the panels may not operate at 100% of rated output, but they will work.

#### **MAINTENANCE:**

While very little maintenance is required on this entire unit, there are a few things that the owner can do to keep the Solar Stik™ in top condition.

1. A corrosion inhibitive lubricant should be applied to all moving parts, joints and electrical connections regularly.
2. Regular visual inspection of the electrical connections, mast, support arms, solar panels and wind generator (if installed) is recommended.
3. Keep the Solar Stik™ clean. Dirty panels and wind-generator blades (if installed) inhibit production of electricity.

#### **MODIFICATIONS TO SOLAR STIK:**

Please exercise great care when modifying or adding equipment to your Solar Stik™. Unplug the Solar Stik™ from your vessel electrical system for safety. Internal components operating inside the Solar Stik™ can be damaged if careless modification is performed. If an additional plug is necessary for additional mounted equipment, it may be added on the receptacle mounting plate under the existing power receptacle.

**If strengthening of the transom mount is required due to a thin transom material or a lifting davit being used on the Solar Stik™, please see page 32 of this manual for information regarding the Solar Stik™ Bracing Kit.**

**WARRANTY:**

Water to Wine Concepts, Inc. warrants the Solar Stik™ and mount for a period of 5 years against construction and workmanship defects. The Solar Stik™ has been designed to supply the vessel with years of trouble-free operation. Please consult the solar panel manufacturer's literature for warranty information pertaining to their products.

While Water to Wine Concepts, Inc. assumes full responsibility for the construction of the mast, solar panel arm assemblies, and mount, the customer assumes full responsibility for proper installation of the transom mount to the boat and correct solar panel installation to the Solar Stik™. We are not responsible for damage done to the Solar Stik™ assembly or to the vessel as a result of poor installation. The owner also assumes full responsibility for any and all modifications made to the Solar Stik™, as well as any damage arising from modifications.

The complete Solar Stik™ is an electrical device designed to supply your vessel with electrical power. Damage can occur to the internal components when improper care is exercised during modifications. We are not responsible for any damage caused to the unit due to improper procedures or care during installation, modifications or operation.

**ACCESSORIES:**

It is **highly** recommended that the Solar Stik™ be used in conjunction with the supplied charge controller (Blue Sky Energy Solar Boost™ 2000E). The founders of Blue Sky Energy pioneered Maximum Power Point Tracking (MPPT) technology years ago, and we use and recommend their Solar Boost™ 2000E to be an integral part of the Solar Stik™ system. Utilizing MPPT, this unique charge controller allows the Solar Stik™ to operate at rated panel voltage, which is often much higher than battery voltage. This results in up to 30% more power supplied from the Solar Stik™ compared to the "industry standard" solar-to-battery connection! If your solar array is producing power, doesn't it make sense to use it all? (Refer to Solar Boost™ 2000E manual for installation details and procedures)

Also available for the Solar Stik™:

- \*Marine Bracing Kit (for reinforcement of the transom mount to a vessel)
- \*Deck Mount Kit (for custom above-deck or through-deck mounting)
- \*24" Height Adapter
- \*Tripod base - constructed of T6061 Aluminum and 304 Stainless Steel (for land use)
- \*Marine antennae mount (single "pole top" or "stand-off" antennae mount)
- \*Slip-on Ham radio antennae mount (mount for multiple antenna applications)
- \*RV Pak power leash connects the Solar Stik™ to a trailerable RV or camper, available in 30 foot lengths, plugs directly into weatherproof connection
- \*Terra Pak provides a semi-permanent installation of the Solar Stik™ to a 12 volt battery bank, and provides "Plug & Play" operation.
- \*Power Pak 50 & 100: 12 volt Power Paks available in 50 or 100 amp-hour configurations, providing mobile DC & AC power through the user interface.
- \*Padded transport cases for the Solar Stik™.
- \*Replacement parts are available from Water to Wine Concepts, Inc.

**For more information, go to [WWW.SOLARSTIK.COM](http://WWW.SOLARSTIK.COM)**

The Solar Stik™ provides 3 mechanical motions which provide maximum solar panel exposure to the sun. The following profiles demonstrate these abilities and provide basic reference points:

PROFILE A: (page 17)

Shows horizontal latitudinal axis - panels fold down against mast / panels pictured in place on lifting arm

PROFILE B: (page 18)

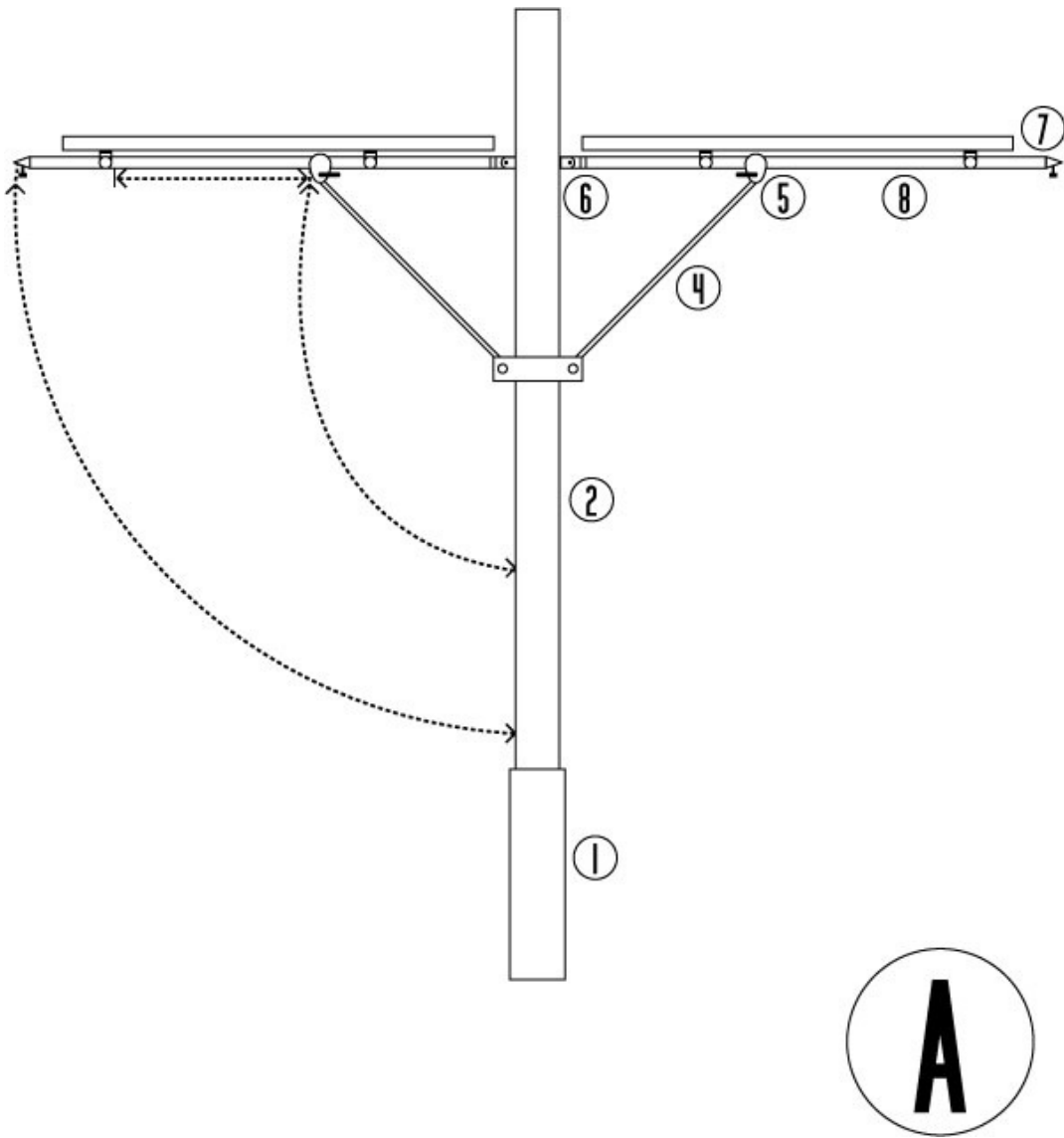
Shows horizontal longitudinal axis - panels rotate on lifting arm / panels pictured in place on lifting arm

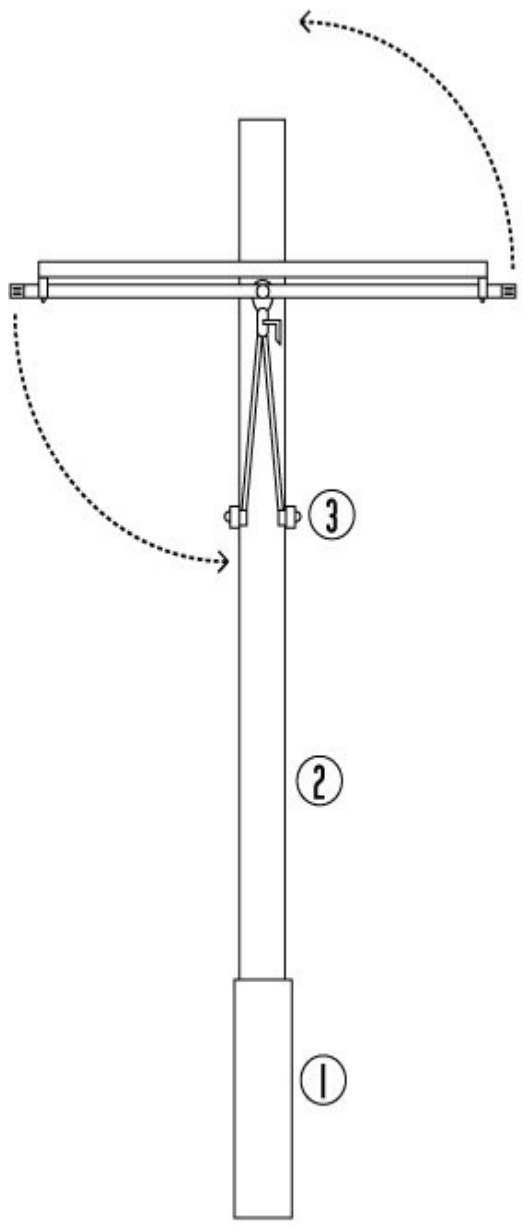
PROFILE C: (page 19)

Shows vertical axis - entire mast assembly rotates in base socket / panels not pictured on lifting arms

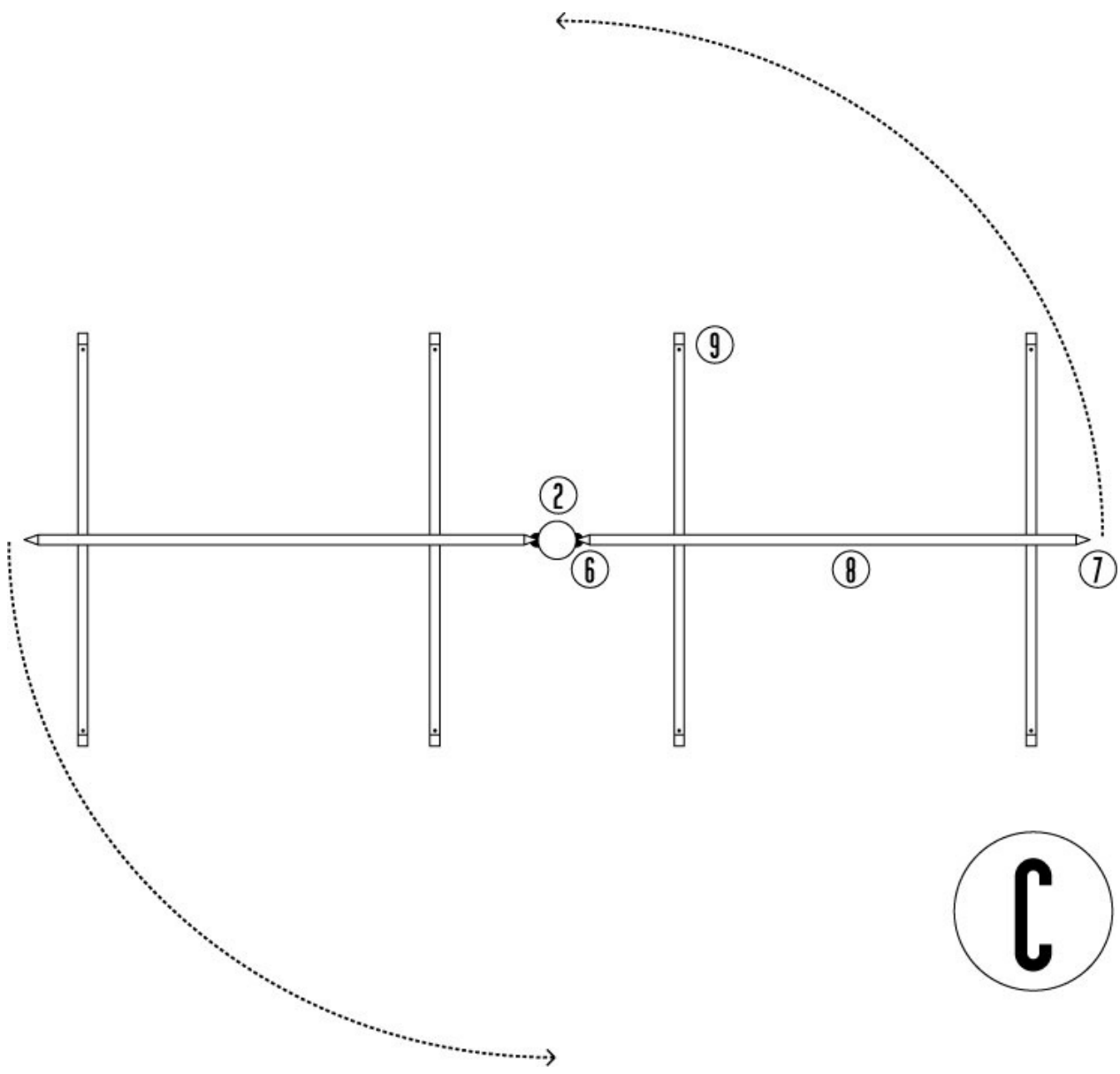
REFERENCE NUMBERS:

1. Mast socket - entire mast assembly rotates in base socket
2. Mast - supports solar panel lifting arm assemblies / provides vertical clearance for solar panels operating on the horizontal latitudinal axis.
3. Solar panel support arm hinge point
4. Solar panel support arm
5. Solar panel lifting arm slide clamp / allows placement of panel in desired attitude
6. Hinge & pin assembly for solar panel lifting arm to mast
7. Solar panel lifting arm axle handle (round knob)
8. Solar panel lifting arm horizontal longitudinal axis - rotating tension is adjusted at the axle handle (round knob)
9. Lifting arm solar panel attachment points





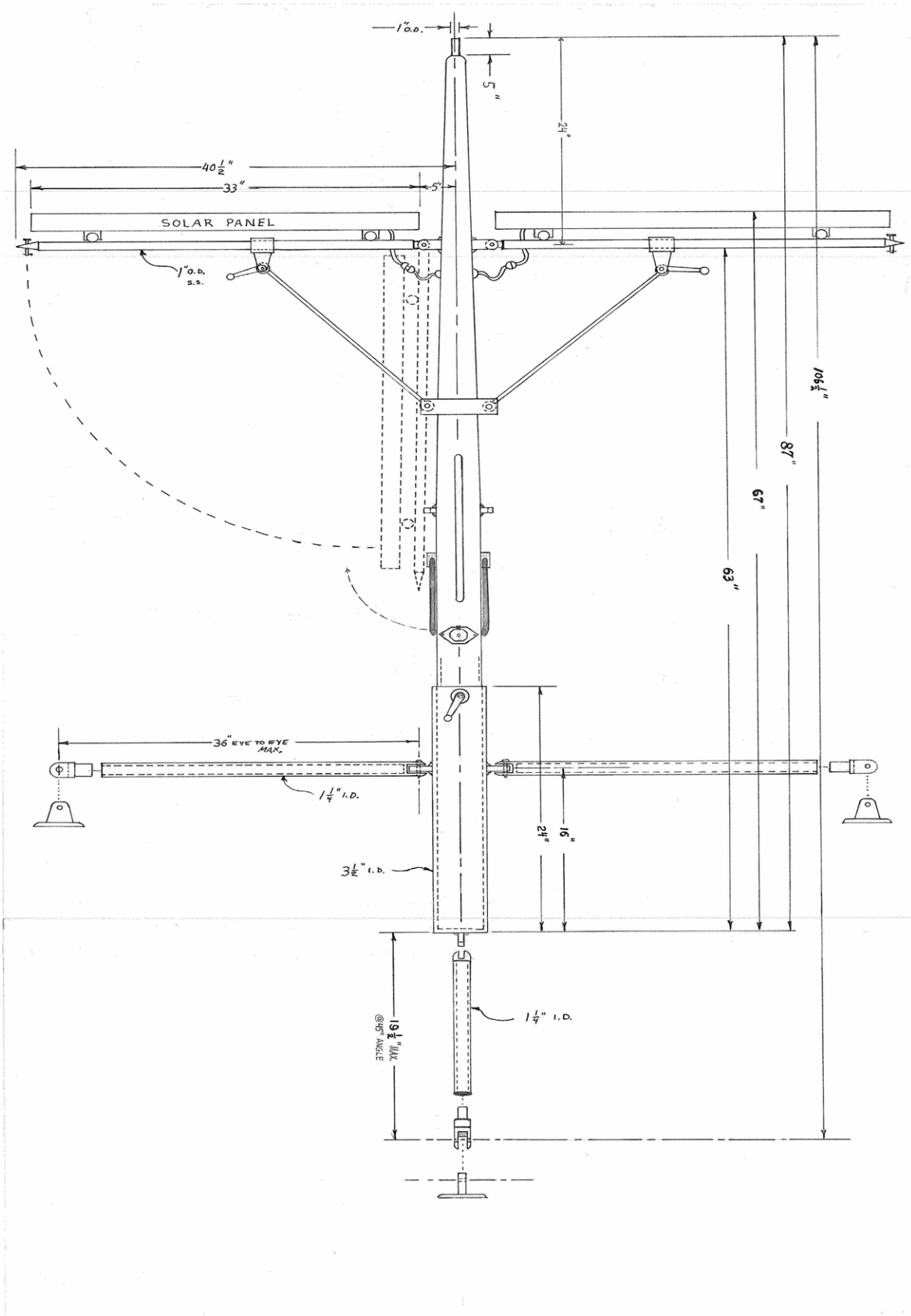
**B**



**C**



Dimensional front profile:



Additional Technical Specifications:

Solar Stik™ Mast Assembly:	T6061 Brushed Mill Finish Weight:	(BMF) Aluminum 23 lbs.
Solar Stik™ Solar Panel Arm Assembly:	BP 350U Multi-Crystalline Solar Panel (see data sheet) Solar Panel Lifting Arm Weight:	304L Stainless Steel 17 lbs.
Solar Stik™ Tripod Base:	Mast socket: Tripod legs:  Leg supports: Weight: Height: Tripod Socket Diameter: Tripod "Deployed" Footprint:	T6061 BMF Aluminum T5052 Anodized Brushed Aluminum 304L Stainless Steel 21 lbs. 25 inches 4 inches 50 inches
Solar Stik™ Transom Mount:	Mast socket: Support arms: Weight: Mount Socket Diameter: Support Arms Length:  Foot Pad Diameter: Foot Pad Holes:	T6061 aluminum T5052 aluminum 15 lbs. (Un-cut) 4 inches 30 inches Lower arm (Un-cut) 36 inches Upper arms (Uncut) 4 inches 4 countersunk 5/16"
Electrical Wiring:	Pre-wired mast and solar panel arms: 12V DC 12ga. (Terminal 1) Solar negative - (black) 12V DC 12ga. (Terminal 3) Solar positive + (red) 12V DC (Terminal 2) Accessory Connectors: Polarized Weatherproof Plugs	
Solar Stik™ Power Output:	5.8+ amps nominal @ 17.5V DC 3% loss using Solar Stik™ accessories	

(See attached solar panel data sheet for BP solar panel information)

**ABOUT US:**

Water to Wine Concepts, Inc. is located in historic St. Augustine, Florida. The company was founded for the purpose of introducing creative new products to the U.S. market. Years of developmental research have been invested by the partners in refining our product line. It is the intention of Water to Wine Concepts, Inc. to introduce unique, innovative, and functional products to the marketplace, beginning in August 2006.

We are proud to offer our latest designs... the Solar Stik™ and the Power Pak, two revolutionary technologies for the energy industry. The Solar Stik™ is a completely independent power station, requiring nothing more than daylight to operate. Portable, lightweight, and rugged, this technology introduces solar energy into many markets where it was not previously an option. The Power Pak provides the most versatile DC/AC power platform available today, and has redefined the standard for all other portable battery packs on the market. The volatility of the worldwide energy market has amplified the need for a power source that is not reliant on fossil fuels. Water to Wine Concepts, Inc. has been working to overcome the traditional problems associated with solar energy production and usability for several years, and the result of our relentless, progressive research and design-work are the SOLAR STIK™ and the POWER PAK. The solar energy industry is blossoming due to the world's energy demands... we are proud to be the front-runner in designing versatile, user-friendly solar energy systems that go wherever you do. Crossing oceans, taming the wilderness, or aiding disaster-relief operations, the Solar Stik™ provides DC power where you need it... "Power On The Move!"

TECHNICAL SUPPORT LINE: 800-793-4364 (available weekdays 7AM to 7PM EST and Sat. - Sun. 9AM to 4PM EST)

ADDRESS: Water to Wine Concepts, Inc. R&D Facility  
226 ½ West King Street  
Saint Augustine, Florida 32084

**OPERATING TIPS & FREQUENTLY ASKED QUESTIONS:****INSTALLATION:*****I've seen the Solar Stik™ at boat shows. It looks too big and heavy to fit on my boat.***

The Solar Stik™ weighs a total of about 80 lbs. when fully assembled, roughly the equivalent of a ten year old child. The “footprints” of the installed Transom Mount system and Deck Mount system are small, and when the Solar Stik™ is deployed for use, the solar panels will be above the “operational” area of the deck. The system was originally designed for sailboats in the 25' range, but has since been used successfully on 60'+ boats.

***Why is the Solar Stik™ mast tapered?***

The mast-top mount (for wind generator, radar, or other equipment) and the upper solar panel connection fittings require structural welding on the inside of the mast, therefore, a wedge is cut out to allow access for the internal reinforcement. When the welding is completed, the mast is compressed into the shape of an airfoil instead of welding the wedge material back into place. This lessens the weight of the system by about 15lbs and gives the mast a unique look.

***How will my Solar Stik™ be delivered?***

The Solar Stik™ system will be delivered in two boxes and a reinforced tube:

Box #1 - mount of choice / MPPT charge control / battery temperature sensor / instructions

Box #2 - solar panel Lifting Arm assemblies

Tube - Solar Stik Mast assembly

***How long does a typical installation of the Marine Solar Stik™ take?***

The Transom Mount System installation is basically a “bolt-on” process and usually takes 3-4 hours to complete. The installation of the Deck Mount System is a more complicated process, often requiring fiber-glass work or welding, and will take longer.

***Do I need a charge controller for my Solar Stik™?***

We HIGHLY recommend that the supplied charge controller be installed to regulate the power to your batteries. Direct connection to the battery bank from the Solar Stik™ could severely damage your batteries by overcharging, leading to battery leakage, reduced battery life, and reduced solar panel efficiency.

***How do I allow for drainage of the Solar Stik™ Deck Mount system below the deck level?***

The Deck Mount comes with a single drain hole in the middle of the bottom. If this hole is not to be used for drainage, then caulk the hole shut. We recommend that a drain be placed in the bottom of the mounting socket, whether it is at the side or off-center on the bottom. The wall thickness of the Deck Mount will allow for placement of a hose-barb fitting so that it may be drained overboard.

***Why were BP solar panels chosen for use on the Solar Stik™?***

The primary reason BP panels were chosen was because of their power output. Routinely, the BP panels power-output exceeded their 50 watt power rating when pitched into direct sunlight. In addition, the clear anodized aluminum frame is the strongest available on the market. As a result, the BP solar panels are ideally suited for manual adjustment when aiming The Solar Stik™ toward the sun.

***Do I need to install blocking diodes into my system?***

The solar panels come factory-equipped with blocking diodes. No additional diodes are necessary.

***Who can install a Solar Stik™ on my sailboat?***

We recommend that the Solar Stik™ be professionally installed by a licensed marina or boatyard. However, it is in the realm of ability of many sailors to install this unit correctly. A careful and detailed installation of this unit is ABSOLUTELY NECESSARY. If you are not capable of performing a proper installation yourself, please seek professional help from the shop of your choice. Solar Stik™ instruction manuals are available for download from this website and will help in finding a qualified installer by allowing you to review the installation process with them directly from the manual before any work is performed.

***Once the Solar Stik™ Transom Mount is fitted to my boat, can I weld the arms together rather than drilling and pinning them together?***

Absolutely! Although the "drill and pin" method is strong and safe, welding will give the mount a true "custom" finish. All marine materials are brushed, anodized T5052 aluminum and additional metalwork can be added to suit the vessel-owner's specific needs.

***Can I install a marine Transom Mount Solar Stik™ on my RV?***

This is NOT recommended.

***Can I use the same Solar Stik™ for my boat and my RV?***

The Solar Stik™ can "multi-task" by adapting to any of the mounting systems available for it. For example, the same Solar Stik™ can be used for your boat and your RV. Both a marine mount and a tripod must be purchased for use with the system, which can easily be transferred between the two mounts as needed.

***What size wire and fuse do I need to use when installing the Solar Stik™?***

The Solar Stik™ produces about 8 amps when it is operating, and therefore we recommend that it should be wired to the battery bank as a 10 amp circuit with a 15 amp in-line fuse. Consult a "wire-sizing" gauge to determine the proper wire size that corresponds to the wire harness length between the Solar Stik™ and the batteries (including the location of the charge control).

**OPERATION:*****Is there a "break-in period" for a new Solar Stik™?***

The mechanical parts of the Solar Stik™ may at first be a little difficult to operate or get used to. For instance, the rubber solar panel latches may be a little difficult to stretch when locking the panels into the "down" position, but they become easier to operate as you use them. Normal "break-in" periods range from 1-3 months of regular use.

***How much power will the Solar Stik™ produce?***

On average, with a sunny day and proper solar panel orientation, you can expect to harness about 80 amp-hours per day. This typically requires a minimum of 2-3 panel adjustments during the day. There are exceptions to this because there are longer and shorter days during the calendar year. For example, during the summer months, one may see as much as 90 amp-hours per day depending on operating conditions and geographic location.

***I have sometimes seen 8.8 amps registering on the Solar Boost™ control. Is this possible?***

The Solar Stik™ gives solar panels the two main ingredients that they need to operate at their "maximum" output: direct sunlight and sufficient cooling. Three axes of rotation mean direct aiming at the sun ALL day, and the high wing-like arms mean the panels get extremely good airflow against the panel, keeping the panel temperature low (which substantially aids in power output). By placing the panels in an environment where these two factors are optimally met, the Solar Stik™'s BP350U panels are able to operate at or even briefly above their STC rating for most of the day. Additionally, when a panel is operated at its maximum, MPPT technology is also at it's best. The Solar Stik™ maximizes ALL of the operating factors through a unique mounting system, and is complemented by the best MPPT technology available.

***Is the power output rating on a solar panel the maximum that it can produce?***

Solar panel operating characteristics (watts, amps, volts) are rated at "STC", or "standard operating conditions", which are set and vary by individual manufacturers. Current, voltage and wattage at STC are NOT "maximums", and these values can be higher at times depending on operating conditions and panel brand. Solar panel output is affected by the cell operating temperature and panels are rated at a nominal temperature of 25 degrees Celsius. The output of a solar panel can be expected to vary by about 2.5% for every 5 degrees Celsius variation in temperature. As the temperature increases, the output decreases. For example, if the panels are very cool due to cloud cover, and the sun bursts through the cloud, it is possible to exceed the rated output of the panel until the panel temperature increases.

***What can I power with my Solar Stik™ ?***

The Solar Stik™ will produce about 80 amp-hours per day of energy and is designed to operate with a 12 volt battery bank. Battery banks are commonly found in boats, recreational vehicles, golf carts, and Power Paks. Go to the SOLAR SCHOOL section to learn how to figure out the power requirements for your specific application.

***Can I connect a DC appliance directly to the Solar Stik™ ?***

This is NOT recommended. Damage to the appliance or Solar Stik™ could result from a direct connection. The solar panels are an UNREGULATED DC power supply which has varying voltage outputs, and can damage an appliance if the voltage is higher or lower than the acceptable voltage input. The Solar Stik™ is designed to work in conjunction with a 12 volt DC battery bank only.

***How often should I change the position of the solar panels?***

In order to maximize the amount of solar energy produced, the panels should be facing east for the morning sun, straight up for the noon sun, and west for the afternoon sun. Remember, *direct sunlight* means *more power!*

***What if we aren't present to change the solar panel tilt?***

We understand that someone may not always be available to tilt the panels, so in this instance, the panels should be left facing the "noon" sun. This will allow for the greatest amount of solar panel operation in a "fixed" position.

***Won't the Solar Stik™ mast or wind generator cast a shadow onto the panels?***

Because of the Solar Stik's™ ability to rotate and pitch, any shadows should be **behind** the solar panels. The sun will only be directly overhead for a brief period during the calendar year because of the earth's orbit around the sun. During 5 years of testing, any shadows from the wind generator or mast were quickly fixed by rotating the Solar Stik™ until the panels faced the sun.

***What if the sun isn't shining, will the Solar Stik™ still produce power?***

If there is light, then the solar panels are going to function. It may be that they produce less energy in reduced light conditions, but they will still function to the best of their ability.

***Should I remove the solar panels for inclement weather?***

The Solar Stik™ is completely weatherproof and designed to withstand the harsh marine environment, as it was originally designed for cruising sailboats. The solar panels are designed to lock in the “down” position for rough seas or inclement weather; however, in a high wind environment (greater than 50 miles per hour), it would be best if the panels were removed. For instance, tropical storms or hurricanes would warrant panel removal. We designed the Solar Stik for easy panel removal and it can be done in a matter of minutes. Removal of the mast from the base socket is probably not necessary (although extremely easy if warranted) as it does not pose much wind resistance. The tripod-mounted Solar Stik™ can handle inclement weather just as well, provided the legs are attached to the ground via stakes, or using the alternative methods below.

***Expanded Footprint:*** If the tripod is placed on a hard surface during windy conditions, plywood (2'x2'x3/4" square pads) may be screwed to the bottom of each leg. This will aid in stabilizing the unit by giving it a lower center of gravity and a wider ‘footprint’.

***Quick-Sand:*** If the tripod is placed on a soft surface, such as on a sand dune, the tripod may be deployed and then “buried” in the sand up to 16 inches deep, leaving at least 8 inches above the ground. The Solar Stik™ system is not affected by sand.

***Can I use the Solar Stik™ to power our house?***

Although the Solar Stik™ produces DC power and most home appliances use AC power, you could power some appliances in your home with the Power Pak 50 or the heavier duty Power Pak 100 and their inverters. The Solar Stik™ & Power Pak work well for remote homes with no access to traditional power supplies, or supporting critical appliances after a hurricane when power may be disrupted for weeks. For example, you could operate a small refrigerator, television, radio, computer, or other devices. Visit the SOLAR SCHOOL section to learn more about appliance loads.

***How do I know when my boat's batteries are fully charged from the Solar Stik™?***

The Marine Solar Stik™ is sold as a complete package and includes a digital MPPT charge control. This control displays the battery voltage. If the supplied control is not to be used, it is still recommended that a charging regulator be installed in the boat's charging system in conjunction with a voltage meter that displays battery voltage. This will give you “maintenance-free” operation when the Solar Stik™ is connected to the system. We recommend and supply the BLUE SKY ENERGY, INC. line of products as they perform both charge control and system display functions. Consult the battery manufacturer literature to find out what the rated battery voltages are for your particular battery.

***How many persons does it take to setup a Solar Stik™?***

In most cases just one, and the Solar Stik™ is designed to be erected and functioning in less than five minutes. Disassembly is also less than five minutes performed by one person.

***What if we want to permanently attach the Tripod base mount to a structure?***

The feet and base of the tripod base mount can be screwed to any surface using standard hardware. Simply adjust each leg independently to the correct orientation, and attach to the surface. We recommend using stainless steel hardware for any permanent installation.

***What would happen of the Solar Stik™ were submerged or dropped overboard?***

The mast assembly would float for a few minutes, but the solar panels would definitely sink. Take care not to drop the Solar Stik™ overboard. If submersion in fresh water occurs, place the system in a well ventilated area and allow to dry. If immersion in salt water has occurred, immediately flush all components of the Solar Stik™ with fresh water EXCEPT for the internal components of the solar panel junction box. In either case, open the junction boxes on the back of the solar panels and drain any water that may have intruded. Use a petroleum based spray to remove any water from the electrical connections or junction boxes. Allow adequate drying time before returning to service. Once submerged, electrical wiring and connections will degrade quickly, so frequent inspection and treatment is recommended.

***How could I prevent theft of the Solar Stik™ without removing the entire system?***

System removal is extremely easy and is the most desired method of avoiding theft; however, for temporary theft prevention, an ordinary bicycle chain/cable lock may be used.

***Will the Solar Stik™ survive a NEMP (nuclear electro-magnetic pulse) blast?***

There is no definitive answer to this question, and much of the answer lies in the intensity of the EMP. Tests were conducted a few years ago by the NBS (now NIST) on the resiliency of various devices to NEMP. Results were that a typical solar power system could withstand any probable NEMP event with little or no damage to the junctions of the crystal cells. The system charge controller, as well as any sensitive electronics connected to the system (radios, lights, etc.) would bear the brunt of any damage. The cells and batteries in the test were also mostly immune from any disruptions. Placing over-voltage transient suppressors on the wires from the panels helped protect the controller and equipment during the test.

**MAINTENANCE:*****What should I do in order to maintain my Solar Stik™?***

In addition to regularly wiping the panel surfaces, we recommend periodic use of a silicone OR petroleum based corrosion-inhibitive lubricant on the Solar Stik™. Application should be made primarily at joints, hinges, and base socket as these are the areas that have the most potential for corrosion or abrasion. Occasionally check to make sure the mechanical handles' center screw are snug. Electrical connections should be checked on a regular basis to prevent corrosion and ensure good contact. All electrical connections should be regularly treated with a anti-corrosion treatment.

***How long will my Solar Stik™ last?***

The Solar Stik™ is designed to last the service-life of the panels which is 25 years. We have taken every measure to ensure that this is a high-quality American-made product and that you will not have to "upgrade" to keep functional. Replacement parts are available, but with proper care, should seldom be needed.

***Could the Solar Stik™ ever rust?***

No... however the Solar Stik™ can corrode. Depending on the environment, one may see a slight discoloration in the metals. This is indicative of corrosion on the surface of the metal. Aluminum will oxidize (especially in a marine environment); this is how it "protects" itself. It will often first appear as a very faint, chalky, white powder... and ultimately the aluminum will assume a darker appearance as it becomes "seasoned". The stainless components are "stain - less" and not "stain- proof". You may find an area of faint surface rust on the stainless steel components, but this is normal. Typically, one does not need to worry about these phenomena. The physical signs of concern are pitting, galling, and cracking. Great care was taken to insulate all of the stainless and aluminum parts from one another, but where

screws and bolts are used, direct contact inevitably occurs. TEF-GEL™ was used at these contact points to prevent galvanic corrosion. Regular inspection is recommended.

***I see that two types of aluminum are used for the Solar Stik™ mount and mast... why?***

Aluminum is available in many grades, and should be chosen according to the application. We have selected T6061 and T5052 in the construction of the Solar Stik™ and mounts. High grade T6061 is used for rigid structures and T5052 is used for structures that may require custom shaping. The support arms on the Marine Transom Mount are T5052 so that a custom installation can be performed and the arms modified in a bending machine. The socket and mast assemblies are constructed of T6061, and therefore are rigid, and not bendable. There is no conflict when these metals are in contact with one another and both are very strong.

***What grade of stainless steel did you use?***

The stainless steel we used in the construction of the Solar Stik™ are marine grade 304L and 316. Stainless steel is found primarily in the solar panel lifting arms and supports, the tripod leg supports, and the mechanical handles.

***The brushed aluminum on my Solar Stik is scratched. What can I do to repair the damage?***

Most light scratches in the surface of the brushed aluminum can be repaired with an abrasive or scrubbing pad. Simply rub the pad lightly over the damage until it disappears. Remember to rub the scratch in the direction of the existing brushed finish.

**MODIFICATION:**

***What if I want to install larger solar panels on my Solar Stik™?***

The arms designed for the Solar Stik™ are constructed for the specific panel to which they are attached. They are also designed to handle the loads imposed on the entire assembly by the supplied panels. We do not recommend installing a larger, heavier, panel in replacement of the stock unit as it will compromise the structural integrity of the system, and IT WILL VOID YOUR WARRANTY.

***Can I add additional solar panels to the Solar Stik?***

The Solar Stik™ was designed to physically support only the two 50-watt panels supplied with the unit. The Solar Boost™ 2000E however, will handle up to 25 amps of solar charging current. Therefore, if additional solar panels are desired, they may be added elsewhere and wired into the Solar Boost™ 2000E without any problems.

***Can I paint my Solar Stik™?***

You can paint or powdercoat the aluminum structure of the Solar Stik™, but any painting should be done immediately after purchase, before the unit is put into service. We recommend having the paint applied professionally, as this will ensure proper procedure in preparing the aluminum. It is important that the main pole assembly NOT be painted where it slides into the mounting socket.

***Which wind generator should I install on the Solar Stik™?***

The Solar Stik™ has a 1" outer diameter mount located at the top of the mast and will handle a variety of wind generators, including RUTLAND and AEROGEN. Great care should be used in selecting wind generators, and the blade-span must be the primary consideration and should not exceed about 36" to safely clear the solar panels in all positions. Carefully consult the wind-generator literature and dimensions before purchasing a unit, to determine if it will be able to operate safely.

***The wind generator I have has a 1.5" mounting fixture and the Solar Stik™ has a one inch diameter mount at the top. How do I make it fit?***

Some wind generators will not fit the Solar Stik™ unless an adapter is used. A wind generator adapter is a custom piece that will have to be made by a fabricator for your specific wind generator. When making an adapter, two dimensions will be needed: the length necessary for proper wind generator height and the wall thickness of the material so that the adapter may slip over the Solar Stik™ top and also inside the receiving mount on the wind generator. (NOTE: Be sure to determine the correct height for the wind generator blades so as to safely clear the solar panels during operation in all positions.)

***Can I use the Solar Stik™ existing wiring harness to install a wind generator?***

This is not recommended. The preferred method of installing a wind generator to the vessel's electrical system is through an independent circuit. The MPPT charge control supplied with the Solar Stik™ is designed to handle solar power only. An additional plug should be added to the Solar Stik™ and wired directly to the wind generator.

***What other items can I attach to the Solar Stik™?***

The top of the Solar Stik™ will support items like antennas, television receivers, radar, GPS equipment, satellite equipment... etc.

***Can I get a motor for the arms so that it will "auto-track" the sun?***

This system is designed for manual operation only. Tracking systems require power to operate and are extremely expensive. If motors were to be added to automatically "track" the sun, the motors' power consumption would greatly reduce the amount of power that is harnessed for the battery bank. Tracking systems are useful in large systems where the amount of energy harnessed is great enough to overcome the loss, but these systems typically generate several thousand watts per hour. Additionally, should a tracking system fail, the effectiveness of the entire system could be greatly impaired. We do not recommend an auto-track system under any circumstances.

***Can I attach other accessories to the Solar Stik™ besides those is available through the manufacturer?***

Yes, just as long as the specific manufacturer's instructions are followed during the process. Great care should be exercised if drilling is necessary, as damage to the internal wiring can result. It is NOT recommended that holes greater than 3/4" be drilled into the Solar Stik™.

***Can I make a longer leash to use between the Solar Stik™ and my RV?***

This is NOT recommended. The length of the leash was determined by the size of the wire and the associated voltage loss. If the leash is longer than 30 feet, the voltage loss will exceed 3%.

***Can I vary the height of my Solar Stik™ in the mount?***

Yes. PVC pipe or fittings can be purchased from any plumbing supply store that will fit inside the base socket. Simply remove mast from the base or mount, slide in the PVC pipe or fittings, and re-install mast when complete. It is recommended that the height adjustment NOT EXCEED 6 INCHES. Height adjustment greater than 6 inches may result in an unsafe condition. If greater height is needed, then purchase of the Height Adapter kit should be considered.

***The Solar Stik™ is too tall. Can it be shortened?***

The Solar Stik™ top mount was designed to hold an accessory item, but if it isn't needed, it may be cut off and this will shorten the mast by 5 inches. For example, this may be necessary if the Solar Stik™ is being stored in the lower bay of an RV. Most RV bays are 7 feet across and the Solar Stik™ measures 7'3" with

the top-mount in place. The Solar Stik™ may also be shortened from the bottom, but it is recommended that the removal of the mast base NOT exceed 3 inches. This modification should only be done by a qualified metalworker. In cases where the Height Adapter kit was installed, The 24" extension may be cut to help achieve the correct solar panel operating height. For example, if an additional 10 inches is required to achieve correct operating height, then 14 inches of the Height Adapter extension may be removed.

***My Transom Mounted Solar Stik™ is shaky. What can I do to strengthen it?***

The Solar Stik™ Bracing Kit is available as an accessory and will help strengthen the overall transom mount installation. It will help if the transom mount is attached to the stern in an area where the stern material is thin or flexes, or if the Solar Stik™ is supporting extra weight such as a lifting davit, radar, or wind generator.

## **SOLAR STIK™ MARINE BRACING KIT**

The Solar Stik™ is designed as a free-standing system. This “free standing” ability results the Transom Mount and/or stern of the vessel having to absorb the high loads and torque that the system can produce. The Brace Kit can strengthen the overall installation of the Solar Stik™ by distributing the weight and torque across additional points between the vessel stern and the Transom Mount. While not always necessary, the Bracing Kit should be used with installations that have either weak or thin vessel stern material, or when the Solar Stik™ will be used to support a lifting davit or other “high stress” applications.

### **THIN STERN MATERIAL**

Some installations of the Solar Stik™ Marine Transom Mount may be to a vessel that has a thin or weak transom. Thin stern material will often flex, and depending on the length of the Transom Mount support arms, the “flex” of the stern will often cause the Solar Stik™ to seem a little loose or unstable. The Brace Kit should be used to strengthen the Transom Mount assembly by distributing the load on the lower support arm to a second point on the stern, enhancing the stability of the overall installation.

### **HIGH STRESS INSTALLATIONS**

Wind generators, lifting davits, or other custom Solar Stik™ configurations may cause the support arms of the Transom Mount to twist or flex. The Bracing Kit can be used to strengthen the Transom Mount’s lower support arm or the upper support arm in applications where the Solar Stik™ mast is supporting extra weight.

### **CONTENTS:**

24" support leg with female pin  
leg clamp with ear  
pin & foot assembly  
backing plate  
hardware

**(Solar Stik™ Bracing Kit sold as an accessory item)**

