

TOP SPEED 2™



ARR:

HCAB5010 – White
HCAB5011 – Yellow
HCAB5012 – Red

AQUACRAFT™
Models by **HOBICO®**

Warranty

AquaCraft™ will warrant this kit for 90 days after the purchase from defects in materials or workmanship. **AquaCraft** will either repair or replace, at no charge, the incorrectly made part.

Make sure you save the receipt or invoice you were given when you bought your model! It is your proof of purchase and we must see it before we can honor the warranty.

To return your Top Speed 2 for repairs covered under warranty you should send your boat to:

Hobby Services

3002 N. Apollo Drive, Suite 1
Champaign, Illinois 61822
Attn: Service Department

Phone: (217) 398-0007, 9:00 am – 5:00 pm Central Time M-F
E-mail: hobbyservices@hobbico.com

TABLE OF CONTENTS

INTRODUCTION	2
SAFETY PRECAUTIONS	2
SPECIFICATIONS & DESCRIPTION CHANGES	3
SUGGESTED FIELD EQUIPMENT	3
USEFUL TOOLBOX ITEMS	3
OTHER USEFUL ITEMS TO HAVE ON HAND	3
ITEMS REQUIRED TO COMPLETE ASSEMBLY	3
BOAT TERMINOLOGY	3
SCREW INFORMATION	3
HELPFUL HINTS	4
KIT INSPECTION	4
FINAL ASSEMBLY INSTRUCTIONS	5
THE BOAT STAND	5
REMOVE THE CANOPY	5
INSTALL THE ENGINE	5
PREPARE THE RADIO BOX	8
INSTALL THE STEERING & THROTTLE SERVOS	9
INSTALL THE REMAINING RADIO GEAR	10
PREPARE & INSTALL THE STEERING & THROTTLE LINKAGES	10
INSTALL THE FUEL TANK	12
ATTACH THE COWL	12
CHECK THE RADIO SYSTEM	13
PERFORMANCE TIPS & RACING BY JERRY DUNLAP	13
PROPELLER INFORMATION	14
RUNNING THE TOP SPEED 2	15
MAINTENANCE	15
RACING	16
NATIONAL MODEL BOATING ORGANIZATIONS	16
PERFORMANCE TIPS	17
ORDERING REPLACEMENT PARTS	19
ENGINE TEMPLATES	19

BEFORE BUILDING

We want the operation of this boat to be a success so **BEFORE** removing any parts from the parts bags, please read this manual thoroughly to familiarize yourself with the model. If for any reason you think that this model is not for you, return it to your local dealer immediately. **PLEASE NOTE:** Your hobby dealer cannot accept a return on any model after the final assembly sequence has begun.

INTRODUCTION



Welcome to the exciting world of outboard tunnel boat racing!!!

Hi, I'm Jerry Dunlap, ten time national racing champion and designer of the Top Speed 2. Thank you for your purchase! I know how exciting a new R/C boat can be and I know you're anxious to get started, but please take time to read these instructions carefully. This manual contains the instructions you need to accurately build, safely operate, and maintain your boat as well as important tips on set-up and racing. If you have any questions regarding assembly, be sure to call the **AquaCraft Product Support** staff at:

(217) 398-8970

9:00am – 5:00pm Central Time M-F

SAFETY PRECAUTIONS

- Use care to **avoid touching the propeller anytime the engine is running**. Pay equally close attention to items such as loose clothing, shirt sleeves, ties, scarves, long hair or loose objects such as screwdrivers or pencils that may fall out of shirt or jacket pockets on to the spinning prop. If your fingers, hands, etc. come in contact with the spinning propeller, you may be severely injured.
- Because of the speed and mass of this boat, it is capable of inflicting property damage and severe personal injury if a collision occurs. **Never run this boat in the presence of swimmers** or where the possibility of collision with people or property exists.
- Radio Control boats are controlled by radio signals, which are subject to possible interference from other R/C transmitters, paging systems or other electrical noise. **Before turning your radio on**, make sure no one else in the area is operating a radio on the same frequency (channel).
- Model engine fuel is poisonous. Do not allow it to come into contact with the eyes or mouth. **Always store fuel in a clearly marked container and out of the reach of children.**
- Model engine fuel is highly flammable. Keep it away from open flame, excessive heat, sources of sparks, or anything else that might ignite it. Do not smoke or allow anyone else to smoke in close proximity to open fuel. Make sure that fuel lines are in good condition so that fuel will not leak onto a hot engine causing a fire.
- Never operate your engine in an enclosed space. Model engines, like automobile engines, exhaust deadly carbon monoxide. **Run your engine only in an open area.**
- Model engines generate considerable heat. Do not touch any part of your engine until it has cooled. **Touching the muffler, cylinder head, or exhaust header may result in a serious burn.**
- **Use safety glasses when starting or running engines.** The propeller may throw loose material such as sand or gravel into your face.

If the buyer is not prepared to accept the liability associated with the use of this product, the buyer is advised to return this kit immediately in new and unused condition to the place of purchase.

SPECIFICATION & DESCRIPTION CHANGES

All pictures, descriptions, and specifications found in this instruction manual are subject to change without notice. AquaCraft maintains no responsibility for inadvertent errors in this manual.

SUGGESTED FIELD EQUIPMENT

Below is a list of items that are generally required to run a non-pullstart nitro boat. You will want to consult your engine's manual for any special items or brands that they might recommend.

- Hot Shot™ 2 Glow starter (HCAP2520)
- Torqmaster™ 90 Starter (HCAP3200)
- Torqmaster 12V 7A Battery (HCAP0800)
- 12V Charger (HCAP0200)
- Hand-Crank Fuel Pump (HCAP3015)
- Nitromethane model boat fuel such as O'Donnell 30% boat racing fuel (DTXP0432, Consult your engine manual for specific requirements)

USEFUL TOOLBOX ITEMS

- #2 Phillips screwdriver (HCAR1024)
- Hobbico® Heavy-Duty diagonal cutter 7" (HCAR0627)
- Metric (HCAR1190) and standard hex drivers (HCAR1195)
- Adjustable wrench
- Pliers (HCAR0625)
- Flex cable grease (HCAB3000)
- After Run Engine Oil (HCAP3000)
- Glow plugs (consult your engine manual for specific requirements)
- Fuel tubing (GPMQ4131)
- Hook & Loop material (GPMQ4480)
- Hobby knife (HCAR0109)
- Cable ties (BUKC2475)
- Extra "AA" batteries (EVEP1202 – 4 pk, FUGP7316 – 16 pk)
- Thread-locking compound (DTXR2010)
- Great Planes® Pro™ CA glue (medium – GPMR6009, debonder – GPMR6039)

OTHER USEFUL ITEMS TO HAVE ON HAND

- Paper towels
- Spray-on glass cleaner
- Sunglasses
- Sun block
- Waders or rubber boots

- Cooler with plenty of ice and soda
- Folding table
- Lawn chairs
- First aid kit
- EZ-up or canopy for shelter

ITEMS REQUIRED TO COMPLETE ASSEMBLY

- 4 or 5-cell Receiver pack (DTXM2010)
- O.S.® .21 XM Engine (OSMG1721)
- Futaba® 2PL 2-channel radio (FUTK01**)
- Drill bits: 1/8" [3mm], 13/64" [5mm] (or 7/32" [5.5mm]), 15/64" [6mm], and 13/32" [10.5mm]
- Phillips head screwdriver (HCAR1022)
- Needle-nose pliers (HCAR0625)
- Adjustable wrench (for changing propellers)

Optional Tools:

- Ultimate Body Reamer (DTXR1157)

BOAT TERMINOLOGY

BOW: The front of the boat

STERN: The back of the boat

PORT: This is the left side of the boat when aboard and facing the front (bow). An easy way to remember this is that both port and left contain four letters.

STARBOARD: This is the right side of the boat when aboard and facing the front (bow).

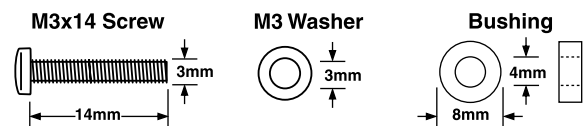
HULL: The body of the boat.

DECK: The top of the boat

SPONSON: The projections at either side of hull that give lateral stability on the water.

HOOKING: The effect caused when one of the sponsons digs into the water and violently spins the rear of the boat around. This usually stalls the engine.

SCREW INFORMATION



Do not use too much force when tightening self-tapping screws. Overtightening will cause the threads in the material to strip. We recommend that you stop turning a self-tapping screw once you feel some resistance as the head of the screw comes in contact with the material. Avoid using powered screwdrivers when assembling this kit. They tend to overtighten the screws. Do not use thread-locking

compound on self-tapping screws. The thread-locking compound may damage the hull. **IMPORTANT:** Use thread-locking compound on any fastener that is threaded into metal or fastened with a nut. Vibration from the engine will cause the screws to loosen if thread-locking compound is not used.

- Place a mat or towel over your work surface. This will prevent parts from rolling off and will protect the work surface.
- Test fit all parts before attaching them permanently.

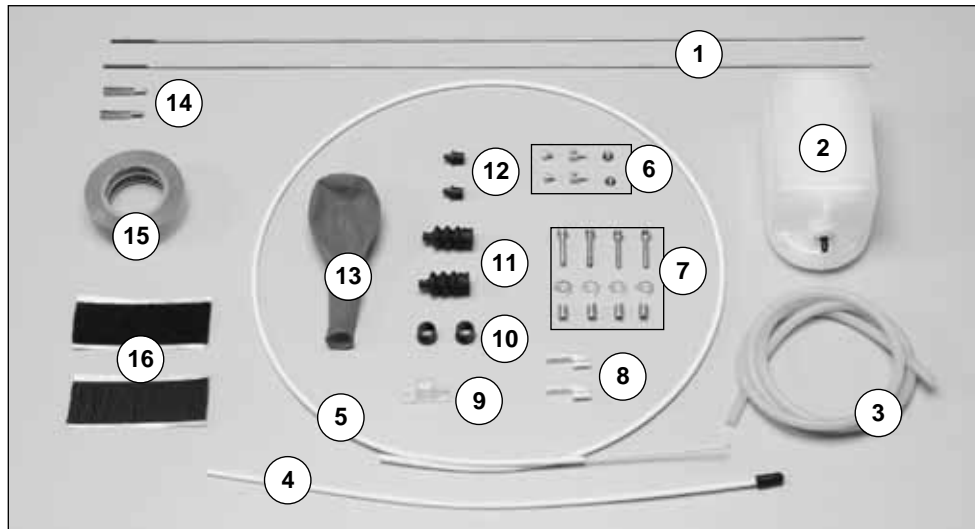
HELPFUL HINTS

- Avoid working over a deep pile carpet. If you drop a small part or screw, it will be difficult to find.

KIT INSPECTION

Before starting to build, take an inventory of this kit to make sure it is complete, and inspect the parts to make sure they are of acceptable quality. If any parts are missing or are not of acceptable quality, or if you need assistance with assembly, contact **Product Support**. When reporting defective or missing parts, use the part names exactly as they are written in the Kit Contents list.

Aquacraft Product Support:
 3002 N. Apollo Drive, Suite 1
 Champaign, IL 61822
 Telephone: (217) 398-8970, ext. 5
 Fax: (217) 398-7721
 E-mail: airsupport@greatplanes.com



Parts (Photographed)

- 2-56 Steering Linkage Rods
- Fuel Tank
- Fuel Tubing
- Antenna Tube w/Cap
- Throttle Cable & Housing
- Quick Connectors
- 6-32 Mounting Bolts, 6-32 Threaded Inserts, #6 Washers
- Nylon Quick-Links
- On/Off Switch Cover
- Steering Link Exits
- Steering Link Seals
- Throttle Housing & Antenna Tube Seals

- Ballon
- 2-56 Clevises (for steering links)
- Radio Box Lid Tape
- Hook & Loop Material

Parts (Not Photographed)

- Cowl
- Hull
- Radio Box
- Drain Plug
- Clevis Retainers (3)
- Ride Pads (2)

FINAL ASSEMBLY INSTRUCTIONS

Carefully remove your Top Speed 2 and stand from the box. Carefully remove all remaining parts bags from the box. **You may wish to keep the box in order to more easily transport and store your Top Speed 2.**

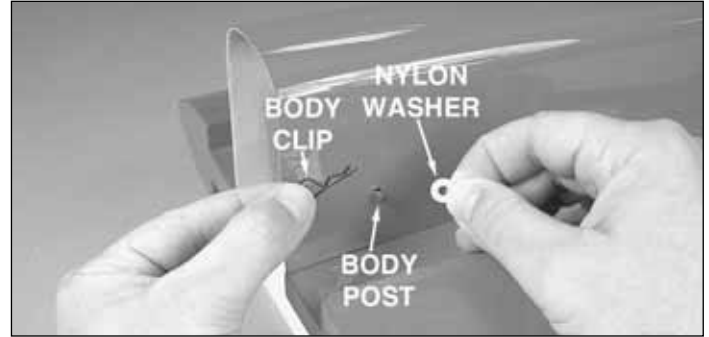
Decals have been provided for your Top Speed 2. Simply cut them out, peel, and stick! See the photos on the box for a decal placement example.

THE BOAT STAND

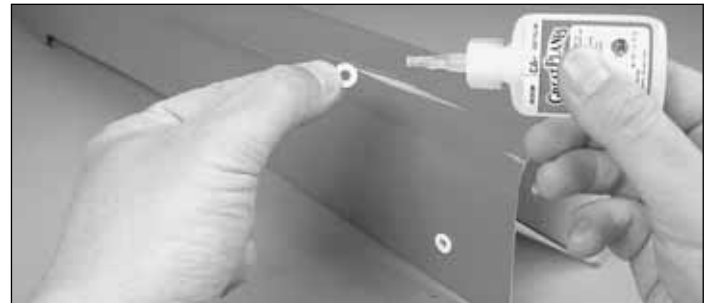


Your display stand doubles as a start and set-up stand. Simply put, when the stand is placed so that the narrow side is up, the stand is ready to assist in servicing your outboard engine during start-up to help prevent stripping out your steering servo gears. Be sure your engine is in the start slot during start-up. When the wide side of the stand is placed up, the stand is in "set-up" position and will allow you to easily adjust the prop depth and thrust angle of the engine.

REMOVE THE CANOPY



1. Locate and remove the body clip and nylon washer at the rear of each side of the cowl as shown.



TIP: Use CA glue to attach the nylon washers in place at the rear of the cowl as shown. This will eliminate one step from removing the cowl and make it easier to keep track of the nylon washers. You may also want to tether the body clips to the cowl with fishing line.



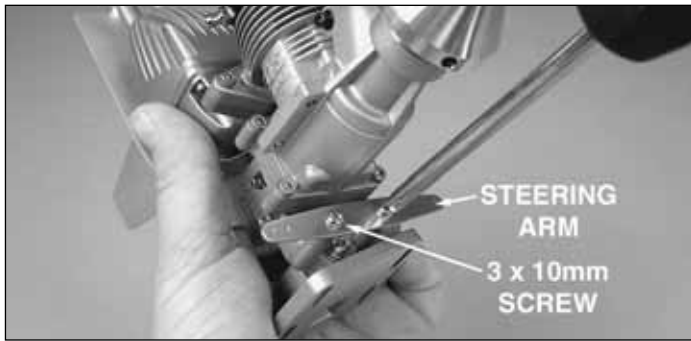
2. Carefully pull the sides over the body posts and lift the canopy free of the hull.

INSTALL THE ENGINE

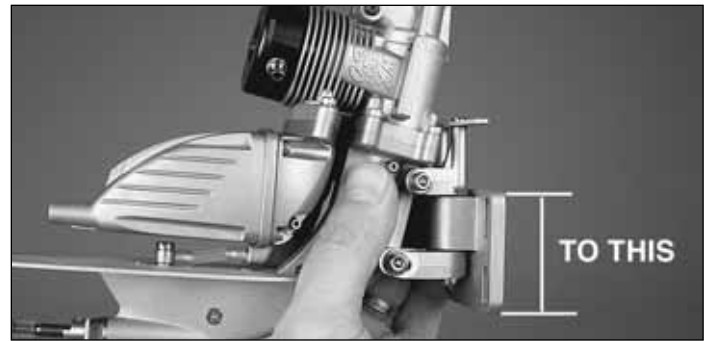
You can use any .21cu in [3.5cc] outboard engine that you want. We have provided instructions and templates for two of the most widely used engine brands currently available.

The O.S. Max 21 XM Outboard Engine

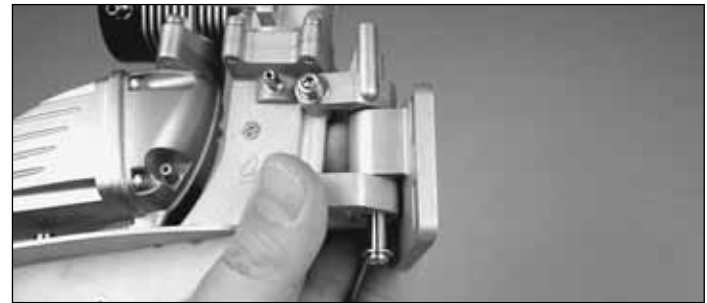
In order to secure the O.S. Max 21 XM to the transom at the correct propeller depth, the mounting plate will need to be inverted. The exploded view of the engine on page 9 of the O.S. .21 XM manual will help identify parts.



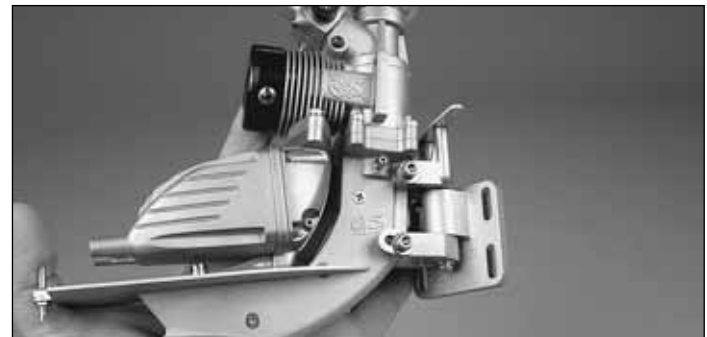
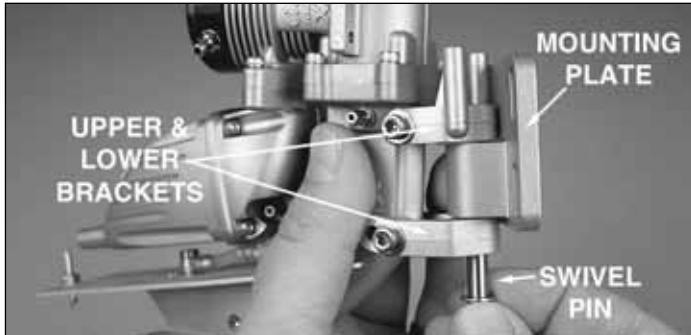
❑ 1. Use a Phillips head screwdriver to remove the two (2) 3 x 10mm screws holding the steering arm to the upper swivel bracket as shown.



❑ 3. Slide the mounting plate out of the swivel brackets and invert the mounting plate as shown. Be certain to replace the nylon washers between the mounting plate and the upper and lower swivel brackets.

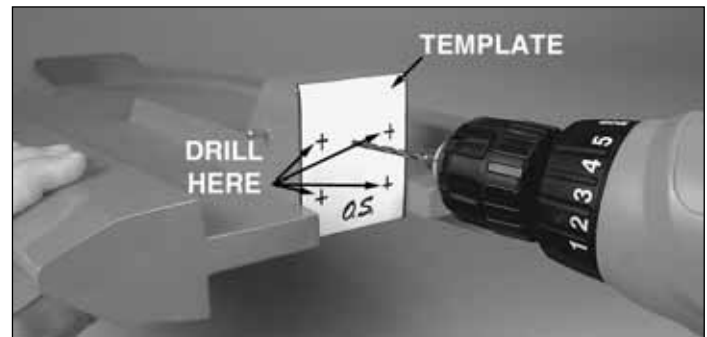


❑ 4. Slide the swivel pin back up through the mounting plate and replace the 4 x 8mm screw.

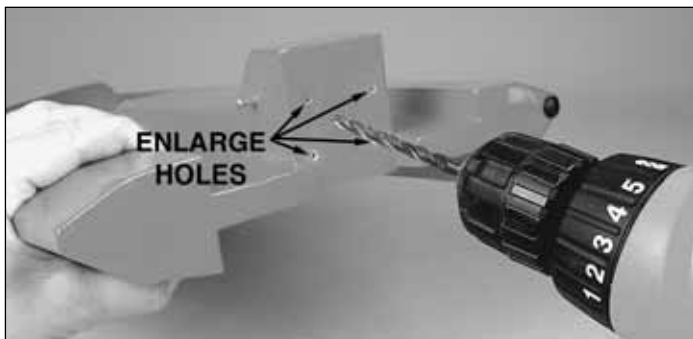


❑ 2. Remove the 4 x 8mm screw from the top of the mounting plate swivel pin and tap the swivel pin out of the upper and lower swivel brackets.

❑ 5. Put the steering arm back in place and replace the two (2) 3 x 10mm screws.



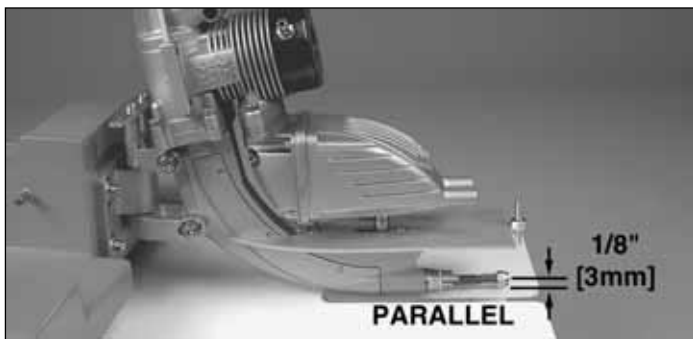
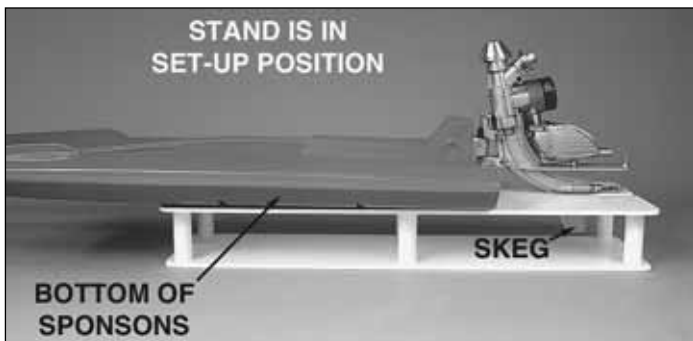
❑ 6. Use Template #1 provided on page 17 of this instruction manual for mounting the O.S. 21 XM. Tape the template in place, mark and drill four pilot holes with a 1/8" [3mm] drill bit. **Very Important:** The holes are 5/8" and 1-5/8" up from the bottom of the transom and exactly centered on the transom.



7. Remove the template and use a 3/16" [5mm] (or 13/64") drill bit to increase the size of the hole to install the 6-32 brass thread inserts into the transom. Using 5-minute epoxy, coat the inside of the hole and outer threads of the 6-32 inserts before screwing them in. This will secure the inserts in the transom. **Be sure the inserts are flush with the transom.**



8. Attach the engine to the transom with 6-32 socket head cap screws and #6 washers. **Do not tighten them completely at this time.**



9. Place the boat on the set-up board side of the starting stand so that the bottom of the sponsons rest flat on the set-up stand and the skeg of the engine is in the slot as shown. Raise the engine so the center line of the prop shaft is 1/8"

[3mm] above the set up board. The prop thrust angle should be parallel to the surface of the set-up board (0° thrust). Once the desired position is attained, tighten the 6-32 socket head cap screws firmly. **Use thread-locking compound and be careful not to overtighten them.**

Note: You will want to check thrust angle and prop depth after all of the assembly steps have been completed and again before running the Top Speed 2.

K&B 3.5 Engines

Since K&B 3.5 engines do not come with an engine mount, you will need to purchase one separately. A popular engine mount choice is the DuBro #3101. Refer to the photos in the "O.S. Max 21 XM Outboard Engine" section above for a visual guide.

TIP: Testing has shown that when using the Top Speed 2 with K&B or other engines that have a shorter prop distance from the hull than the O.S., a 5/8" plywood spacer inserted between the engine and transom improves handling tremendously.

1. Install the K&B 3.5 on the DuBro motor mount so that the section of the black insert holding the swivel pin is at the top of the mount. The DuBro mount comes with an excellent diagram that shows the proper mounting procedure.

2. Use Template #2 provided on page 17 of this instruction manual for mounting the K&B 3.5 outboard engines. Tape the template in place. Mark and drill four pilot holes with a 1/8" [3mm] drill bit for the 6-32 brass thread inserts.

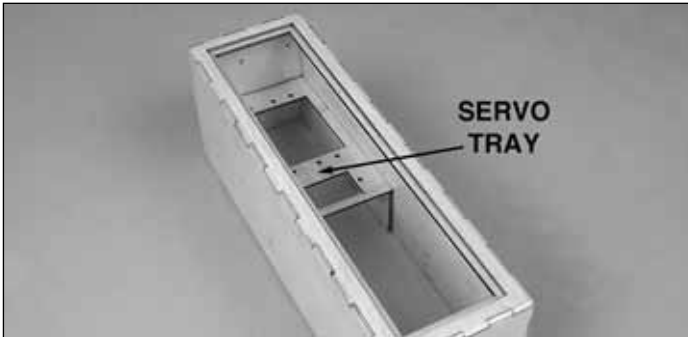
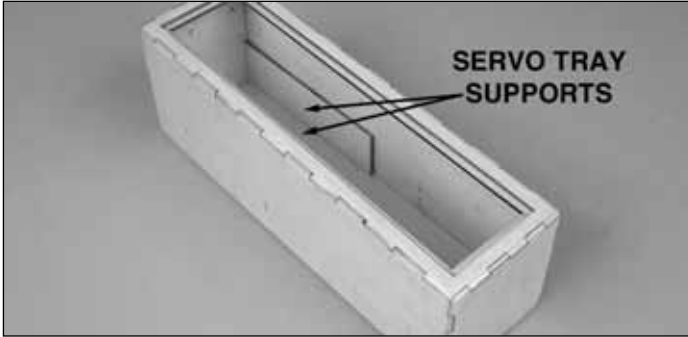
3. Remove the template and use a 3/16" [5mm] (or 13/64") drill bit to increase the size of the hole. Install the 6-32 brass thread inserts into the transom. Using 5-minute epoxy coat the inside of the hole and outer threads of the 6-32 inserts before screwing them in. This will secure the inserts in the transom. **Be sure the inserts are flush with the transom.**

4. Attach the engine to the transom with four (4) 6-32 socket head cap screws and four (4) #6 washers. **Do not tighten them completely at this time.**

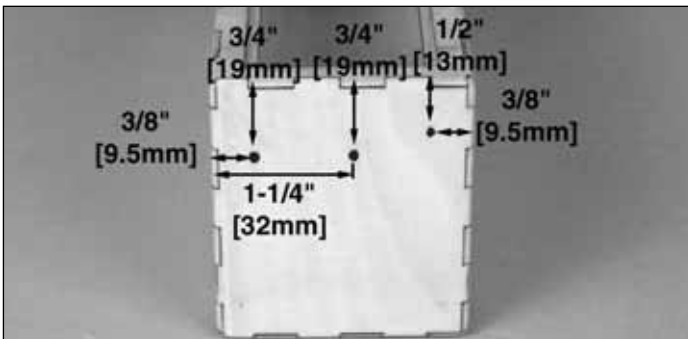
5. Place the boat on the set-up board side of the starting stand so that the bottom of the sponsons rest flat on the set-up stand and the skeg of the engine is in the slot as shown. Raise the engine so the center line of the prop shaft is 1/8" [3mm] above the set up board (Refer to the photo in the "O.S. Max 21 XM Outboard Engine" section on page 4). The prop thrust angle should be parallel to the surface of the set-up board. Once the desired position is attained, tighten the 6-32 socket head cap screws firmly. **Use thread-locking compound and be careful not to overtighten them.**

Note: You will want to check thrust angle and prop depth after all of the assembly steps have been completed and again before running the Top Speed 2.

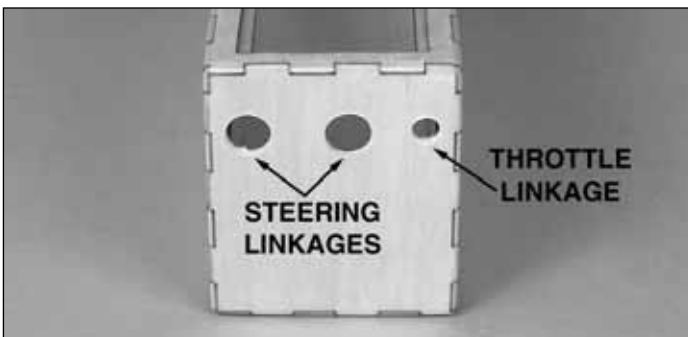
PREPARE THE RADIO BOX



❑ 1. Use CA glue or epoxy to attach the servo tray atop the servo tray supports as shown. The servo tray supports have already been glued in place for you.



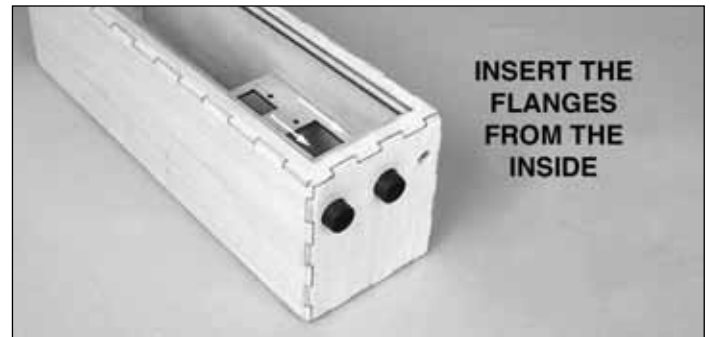
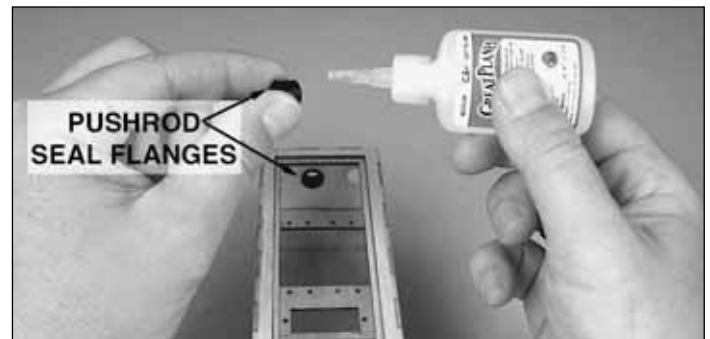
❑ 2. Study the image above. Use a felt-tip pen to make marks **at the end of the radio box with the servo tray** following the dimensions shown.



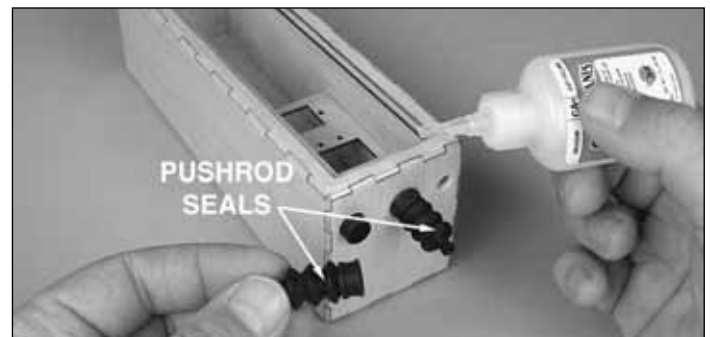
❑ 3. Use a drill with a 3/8" [9.5mm] drill bit* to make two (2) holes in the radio box for the steering linkages at the end of the radio box **with** the servo tray. Keep the plastic pushrod seal flanges nearby to test fit them.

***TIP:** A body reamer can be used instead. Just be sure to check the size of the hole often and be careful not to make the opening too large. If using a drill bit, be careful not to "blow" out through the wood inside the box.

❑ 4. Use a drill with a 7/32" [6mm] drill bit (or use a body reamer) to make a hole for the throttle linkage at the end of the radio box with the servo tray. Keep the rubber throttle pushrod seal nearby for test fit.

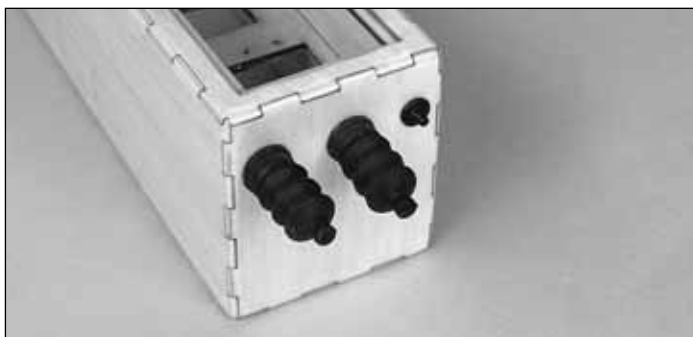


❑ 5. Carefully put a bead of CA glue around the inside edge of the two (2) plastic pushrod seal flanges and insert them from inside the box as shown.

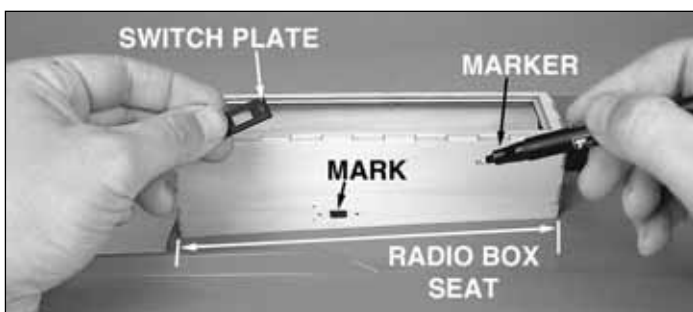


❑ 6. Carefully put a bead of CA glue around the two (2) rubber pushrod seals and fit them over the flanges as shown. It is important to have a good seal to prevent water from entering the radio box.

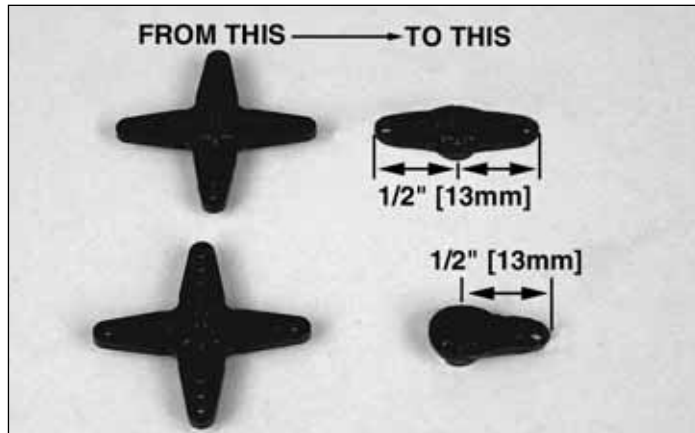
INSTALL THE STEERING & THROTTLE SERVOS



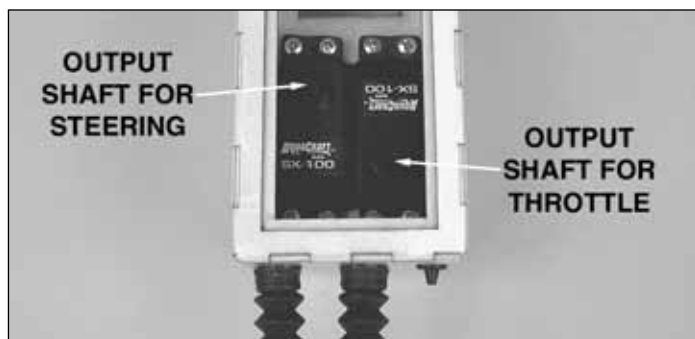
- 7. Put a bead of CA glue on the rubber throttle pushrod seal and insert it in the radio box as shown.



- 8. Place the radio box into the radio box seat on the Top Speed 2 hull as shown and decide where you want to place the ON/OFF switch. **Note:** The Top Speed 2 radio box is taller (slanted) at the aft end to provide more clearance for the control horns. Place the switch plate of your ON/OFF switch on the radio box and outline it with a marker. **You will need to cut a notch in the cowl** to accommodate the switch, so the closer you place the switch to the deck, the easier it will be to take the cowl on and off. We have provided a water-resistant switch cover that you may use with your switch. The size and shape of your ON/OFF switch may vary from the one shown. Refer to your radio system manual for proper radio set-up. **DO NOT permanently attach the radio box to the hull as you will need to remove it from time to time.**



- 1. Cut two X-shaped servo arms down to the configuration shown above. Note that the lengths of the remaining arms have also been decreased by one hole.



- 2. Install two servos with rubber grommets and eyelets as shown. **Note:** Be sure to install the servos exactly as shown, paying close attention to the location of the output shafts.



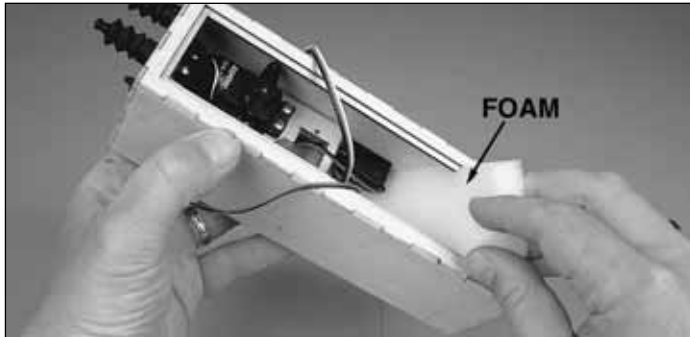
- 3. Install the two servo arms from Step 1 as shown. The port (left) side servo is the steering servo (with full arm) and the starboard (right) side servo (with 1/2 arm) is the throttle servo.

TIP: It is a good idea to install a high-torque servo for steering (Futaba S3305). Refer to the manual that came with your radio system for servo information.

A third slot has been provided to accommodate a mini-servo should you decide to install an onboard mixture control (OSMG8336).

INSTALL THE REMAINING RADIO GEAR

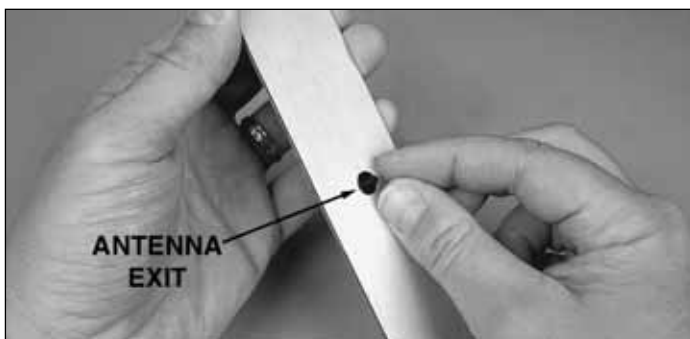
It is a good idea at this point to install the rest of your radio gear.



❑ 1. Locate the included foam padding and cut a 2" x 4" [51 x 102mm] section and install it in the bottom of the radio box.

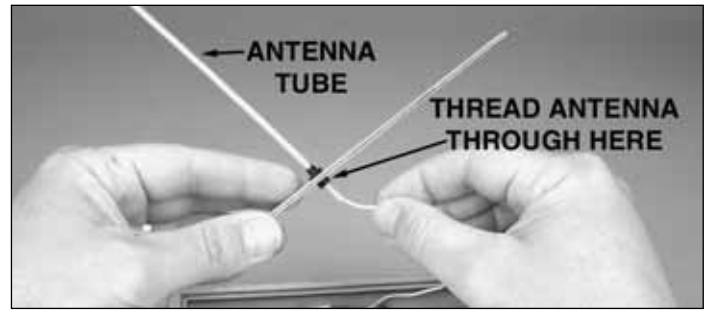
❑ 2. Place your receiver and battery holder (or battery pack) in the radio box and plug in all connectors as specified in the instruction manual of your radio system.

TIP: A balloon has been provided for you to insert your receiver into. Simply insert the receiver into the balloon and run the wires out of the mouth of the balloon. Use the included rubber bands to seal up the mouth of the balloon. This will help to protect your receiver in the event that you flip your boat.



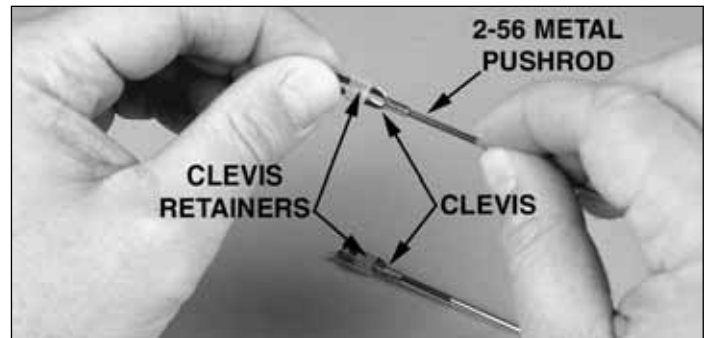
❑ 3. Use a drill with a 7/32" [6mm] drill bit (or use a body reamer) to make a hole in the radio box lid for the rubber antenna exit seal. Keep the rubber throttle pushrod seal nearby for test fit. Place a bead of CA glue on the rubber antenna exit and insert it in the radio box lid as shown.

TIP: Make the hole right above where the receiver lies so that there is a minimum of antenna wire running through the radio box.

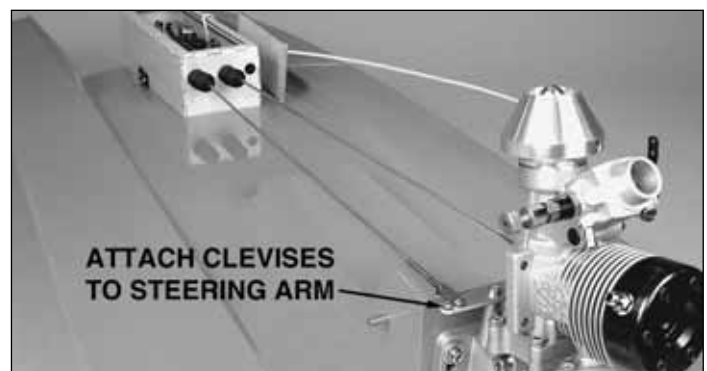


❑ 4. Insert the antenna tube into the rubber antenna exit and thread the antenna up through the tube as shown.

PREPARE & INSTALL THE STEERING & THROTTLE LINKAGES



❑ 1. Locate the two (2) 2-56 metal pushrods and two (2) steering link clevises and assemble them as shown. These are the steering linkages.

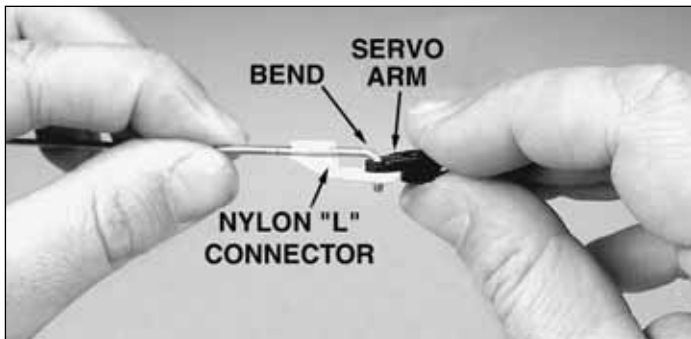


❑ 2. Insert the steering linkages into the radio box as shown and place the radio box in the radio box seat on the hull. Attach the clevis ends of the pushrods to the inner holes of the steering arm of the engine as shown.

TIP: Carefully remove the outer hole material of the O.S. .21 outboard steering arm. This will save you from having to trim the cowling to clear the arm.



❑ 3. Make sure the engine is neutral (use the stand to hold the engine straight) and use a felt-tip pen to make a mark where the pushrods meet the holes in the steering servo arms. Remove the pushrods now so that you can easily work with them in the next step.



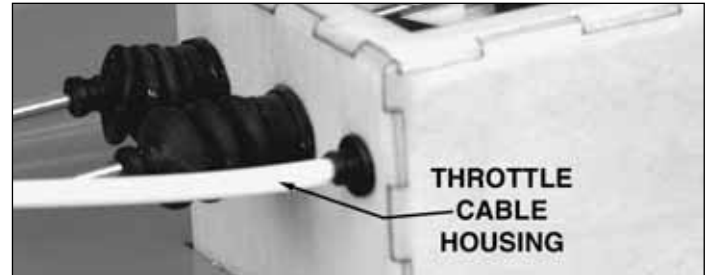
❑ 4. Use pliers to bend the pushrods and wire cutters to cut off the excess as shown. Insert the bends through the servo arm and use the provided nylon "L" connectors (shown) to attach the linkages to the servo arms and reconnect the clevises to the steering arm of the engine.



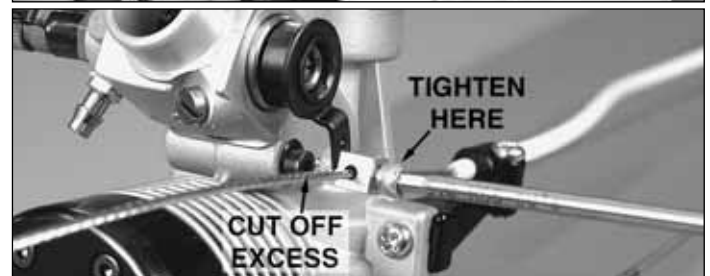
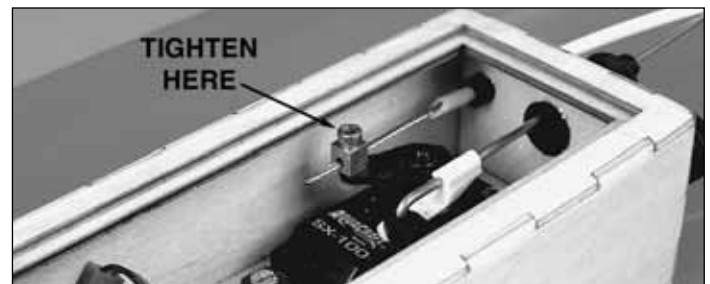
❑ 5. Locate the throttle cable housing retainer and 3 x 10mm S/T screw (included with engine) and fasten it to the engine as shown.



❑ 6. Locate two (2) screw-lock pushrod connectors. One will attach to the arm of the throttle servo and the other will attach to the throttle arm of the engine as shown.



❑ 7. Insert one end of the throttle cable housing (only) into the rubber seal on the radio box and secure it with a drop of CA glue. Insert the other end into the throttle cable housing retainer on the engine and secure it by tightening the 3 x 8mm screw. You will need to cut the housing to fit properly but keep in mind that the engine will pivot from side to side, so make sure there is enough housing to allow the engine to move freely.

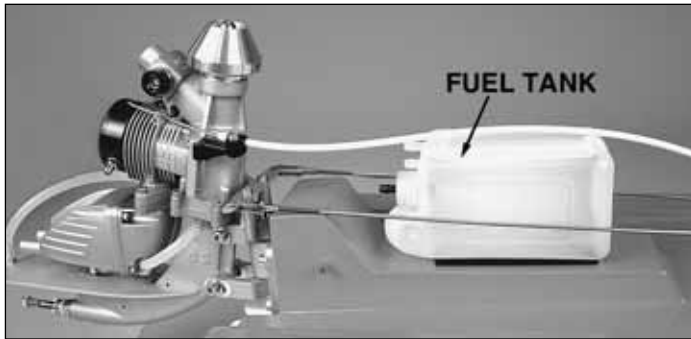


❑ 8. Insert the throttle cable into the cable housing and thread it through each screw-lock pushrod connector and

secure it by tightening the socket head screw (3/32" [2.5mm]) as shown. Cut off the excess after making sure that there is enough throttle cable to allow the engine to move freely.

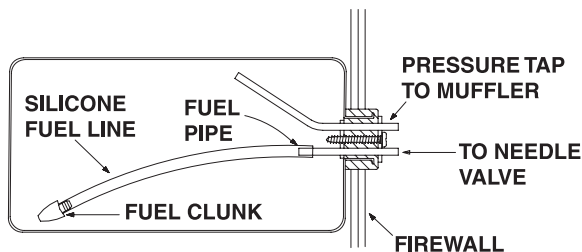
Hint: You can use silver solder (GPMR8070) and coat the ends of the cable to keep them from fraying.

INSTALL THE FUEL TANK



1. The fuel tank sits directly in front of the transom and is held in place with the provided hook & loop material or you may use double-sided servo tape. In either case, be sure to leave enough space so that the fuel tubing is not crimped. **Note:** The steering pushrods are against both sides of the tank. This is normal in tunnel hull boats.

FUEL TANK



2. Assemble the fuel tank as shown in the sketch. When tightening the center screw of the rubber stopper, be sure not to over-tighten it. You just want it snug enough to pull the rubber tight against the opening of the tank.

3. Install silicone fuel tubing onto the aluminum tubes from the fuel tank. The line with the fuel clunk will feed the fuel inlet at the needle valve and the other will attach to the pressure tap on the muffler. Use a minimum of tubing but be careful not to crimp the lines.

Notes: Outboard engines steer by physically pivoting from side to side. Be sure to leave enough fuel line so that the engine can pivot freely. Please refer to your engine's manual for fuel line routing instructions.

If you choose to use some kind of an external fuel valve, follow the instructions that come with your particular brand of fuel valve. You can also install a third line to the tank and use it for filling the tank.

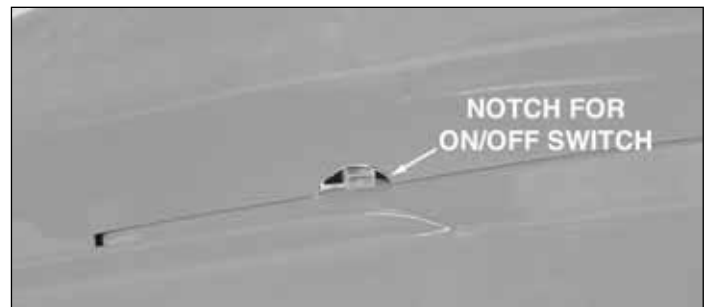
ATTACH THE COWL

PLEASE NOTE: You will need to do four things before you can attach the cowl.

1. Tape your radio box lid shut with the included adhesive tape.



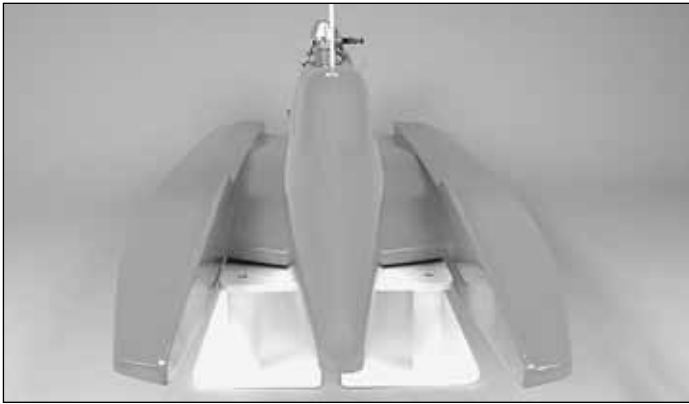
2. Use a drill with a 1/4" [6.5mm] drill bit (or use a body reamer) to make a hole in the top of the cowl (above the radio box) for your receiver antenna to exit through. To get the correct hole location in the cowl, hold the cowl next to the radio box, estimating its location on the hull.



3. Use a hobby knife or body scissors to cut a notch on the cowl for the ON/OFF switch. A rotary tool such as a Dremel® Moto-Tool® works great for this.



4. Now you can fit the cowl onto the hull. Make sure that the engine is able to move freely left and right. If the rear of the cowl is interfering, you will need to trim away some of the material until you have full engine movement.



5. Spread the sides of the canopy so that the holes at the rear fit over the body posts and replace the body pins. You are ready for action!

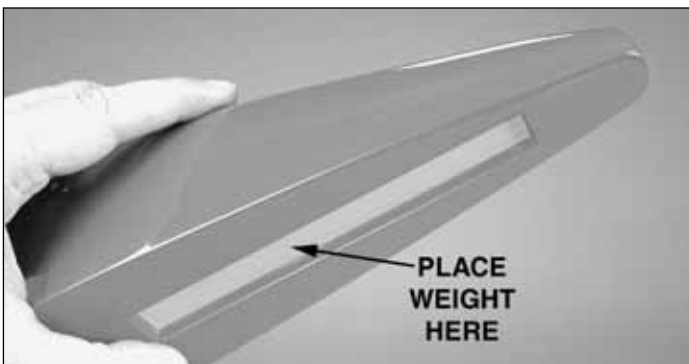
CHECK THE RADIO SYSTEM

- Standing behind the boat with both the receiver and transmitter powered up, rotate the wheel to the left. The back of the engine should move towards the left. Move the wheel to the right. The back of the engine should move towards the right. If this is not the case, you will need to reverse the direction of the servo. Check the instruction manual that came with your radio system for the correct procedure.
- Squeeze the trigger on the transmitter; this should open the throat of the carburetor. Conversely, moving the trigger forward should close the throat completely. If this is not the case, you will need to reverse the direction of the servo. Check the instruction manual that came with your radio system for the correct procedure.

PERFORMANCE TIPS & RACING BY JERRY DUNLAP

BALANCING THE TOP SPEED 2

The Top Speed 2 has been tested and raced with both stock and modified .21cu in [3.5cc] outboard engines with tuned exhaust systems. Use stick-on weight to achieve the correct balance point for your boat/engine combo.



Stock Engines: Place 1 to 1-1/2 oz. of weight* in the forward section of the “weight slot” located on the cowling

chin to create a balance point for running the O.S. 21 XM or the K&B 3.5SS/K&B 3.5 SX. This balance point is 9-1/2" [241mm] from the back of the sponsons.

*The Thunder Tigre 3.5 Outboard weighs more than the other engines and may require additional weight.

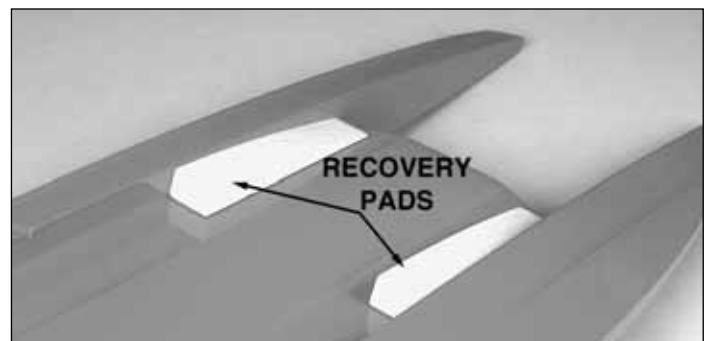
Modified Engines: Achieving the proper balance with a modified engine required applying 3-5 ounces of weight. Since the “weight slot” only holds 2.75 oz. of stick-on weight, it will be necessary to temporarily apply the additional weight to the sponson tips. Once a balance point has been established, the stick-on weight can be removed from the sponson tips and installed into the nose of the cowling. Chop up the additional stick-on weights and mix them with epoxy. Position the cowling with the nose pointed downward, pour the mixture into the nose of the cowling, and allow the epoxy to set-up completely.

BALANCING THE TOP SPEED 2 FOR ROUGH WATER CONDITIONS

Rough or choppy water conditions caused by high winds pose a challenge to operating a model tunnel boat. Additional weight to stabilize the hull should be placed on the balance point rather than the front of the boat. Placing weight on the front will cause the bow to “pitch downward” when bouncing off of waves and submerge the hull. Placing 4-5 ounces of weight over the balance point will decrease the amount of bouncing action.

HELPFUL TIP: A simple method for adding and removing weight from the balance point area is the use of hook & loop material on weight strips and along the center-section of the deck inside the cowling.

RECOVERY PADS



Two recovery pads (shown above) are included with the Top Speed 2. While running a Top Speed 2 with a modified engine and extended lower unit, the boat may hook in turns. The addition of the recovery pads in the forward section of the tunnel floor eliminates this handling problem. The recovery pads assist in preventing the sponsons from dropping too deep in a turn.

PLEASE NOTE: There is no need to install the recovery pads unless the Top Speed 2 exhibits hooking characteristics. Apply thin double-sided tape to the bottom of the recovery pads to provide a temporary installation method.

PROPELLER INFORMATION

PROPELLER SELECTION

The Top Speed 2 has been tested with many engine/propeller combinations. A balanced Octura Models X440 has worked well with both stock and modified engines. Octura Models X-Series provides an extensive selection of propellers. In the Octura prop series, the last two numbers indicate the diameter in millimeters. For example, the X442 is larger than the X440 in diameter by 2mm while the X438 is smaller by 2mm. The X500 and X600 series have more pitch than the X400 series. The Prather 215 propeller is another possible choice.

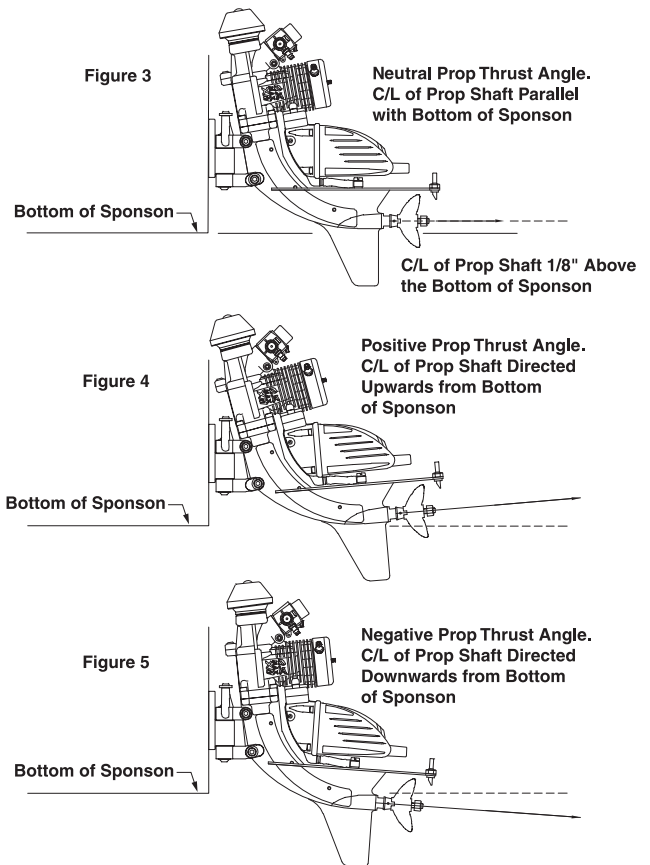
Pitch and diameter of propellers is similar to gear ratios in cars. For instance, an Octura X640 might provide more top end speed than the X440, but not accelerate out of a corner as quickly. Once a base line of performance has been established with a propeller like the X440, changing propellers will provide an opportunity to compare performance.

BALANCING A MODEL BOAT PROPELLER

To avoid damaging the lower unit propeller shaft assembly, balancing metal propellers is highly recommended. Balancing a propeller requires the use of a balancing device such as the Top Flite® Power Point® balancer (TOPQ5700), metal files, and 400-grit wet/dry sandpaper. The front, rounded side of the propeller, is the surface from which material is removed. Follow the curvature of the propeller surface. Continue checking the propeller on the balancer until the propeller is balanced. 400-grit wet/dry sandpaper will provide a smooth finish.

Note: While polishing a propeller improves its appearance, it does not improve performance.

PROPELLER THRUST ANGLE



As an initial starting point, you will want a neutral prop thrust angle and the propeller depth set with the centerline (c/l) of the propeller shaft 1/8" [3mm] above the bottom riding surface of the sponsons (See Figure 3 above). The propeller depth/thrust angle can be established by placing the Top Speed 2 with engine attached on the "Setup Board" side of the Starting/Setup Stand. Loosen the cap head screws holding the engine to the transom and the thrust angle adjustment screws on the motor mount to adjust the engine height/prop thrust.

Retighten all the screws upon establishing the recommended prop depth/thrust angle.

Propeller depth and thrust angle will vary with propellers of different pitch and diameter. Determining optimum propeller depth and thrust angle settings is accomplished by observing the boat while running at full throttle.

Neutral Propeller Thrust – Provides thrust without letting the thrust affect the ride attitude (bow upward/bow down) of the hull.

Positive Propeller Thrust – Causes a "bow upward" ride attitude. A "bow upward" ride attitude increases the chances of the hull "blowing over" (flipping backwards) along with decreasing the cornering ability.

Negative Propeller Thrust – Causes the hull to ride "stuck down" (flat on the water). A "stuck down" ride reduces the speed and can cause the boat to submerge in a turn.

PROPELLER DEPTH

The depth of the propeller has an influence on both engine performance and boat handling characteristics. Running the engine with the center line of the prop shaft above the bottom running surface of the sponsons produces less "load" on the engine and allows the engine to reach peak performance.

Running with the propeller too high will result in diminishing returns. Too high a propeller depth will noticeably affect handling. Running in a straight line, the boat will be unmanageable. A "bucking" or "hopping" ride will occur. Or, the boat may suddenly fall off its supporting cushion of air and hook.

In a turn, it might hook violently and dive under the water. Turning ability will be decreased.

The propeller depth needs to be lowered to correct these handling issues. Determining the correct propeller depth or "Sweet Spot" requires test running the boat. Different propellers work best at different propeller depths. The set-up board side of the Starting Stand/Set-up Board will provide an accurate method of determining propeller depth.

The term "flying the hull" is used when evaluating how the boat is running. When running in a straight line, a tunnel hull should appear to "ride free" which means that it should ride "lightly" on the back 1/3 of the sponsons, as if riding on a cushion of air. The hull should exhibit a smooth ride attitude without excessive "porpoising" (bouncing). Adjustments to the balance (adding or subtracting weight), propeller depth, thrust angles, and type of propeller will all affect the ride attitude.

Propeller thrust angle and propeller depth are key factors in a tunnel boat's cornering characteristics. While cornering, the hull should carve a smooth, consistent arc without "hooking" (spinning inwards) or sliding out of the turn. If the boat is submerging and/or hooking in a turn, adjust the propeller thrust angle to a slightly more positive angle. Lowering the propeller will assist in correcting a sliding condition while cornering. When properly trimmed and balanced, a tunnel boat should be able to "cut" a tight corner at full throttle.

Like any high performance car, airplane, or boat, optimal outcomes in cornering and speed require "fine tuning" the variables listed above.

Model tunnel boats are best suited for operation on calm water locations. Wind and waves present challenges to running a tunnel design. An increase in wind will create choppy water conditions, allowing the possibility of "blowing" the boat off when running into the wind.

RUNNING THE TOP SPEED 2

LAUNCH PROCEDURE

1. Turn the power "ON" to the transmitter and receiver (in that order).
2. Start the engine. (Before running the engine, read the instruction manual that came with your engine.) The propeller will begin spinning as soon as the engine is started. Be sure to stay clear of the propeller.
3. Gently place the boat in water that is at least 8" deep and free of obstacles (weeds, rocks, sticks, ducks, muskrats, etc.). Be sure to stay clear of the spinning prop during the launch.
4. Slowly advance the throttle to full speed and note if the boat has a tendency to turn right or left. Adjust the steering trim knob on your transmitter until the boat runs in a straight line when the steering wheel is at neutral.
5. When finished running, stop the engine and turn the power "OFF" to your boat and transmitter (in that order).

MAINTENANCE

RADIO BOX MAINTENANCE

Lining the forward interior of the radio box with paper towel prior to running will provide cushioning for the radio components and absorb moisture.

Placing the receiver in a rubber balloon will provide added protection from moisture.

Use a water resistant tape when sealing the radio box lid to the radio box.

When finished running, remove the radio box from the hull and wipe away water on the radio box and in the radio box compartment. Remove the tape from the radio box lid and check for moisture.

Should moisture gain access to the radio box, all connections should be dried thoroughly. **Hobbico "Duster"** Compressed Air (HCAR5500) will provide a blast of air capable of blowing moisture out of connectors.

Remove any sticky tape residue from the radio box top and lid. Goof-Off® is a product that works well for removing tape residue.

HULL MAINTENANCE

After running, the exterior of the hull should be cleaned. Common household cleaners can be utilized for cleaning. Areas exposed to fuel/engine exhaust residue should be thoroughly cleaned. Agents in the fuel/exhaust residue can attack the finish if allowed to remain on the surface over time.

Gently pull the rubber drain plug located on the transom and allow any water that may have found a way inside the hull to drain out. Be sure to replace the plug before running the boat again.

MOTOR MOUNT SCREWS

Moisture inside the hull can cause the 6-32 cap head screws that hold the motor mount to the transom to corrode. Remove the screws one at a time, eliminate any moisture/corrosion by applying a coat of lubricating spray (WD 40) and replace the screw. This procedure should be done when finished running for the day. Failure to do so can result in difficulty removing the screws from the brass inserts in the transom. Attempting to remove a corroded screw can result in removing the brass insert from the transom.

ENGINE MAINTENANCE

When you are through running your Top Speed 2 for the day, be sure to remove all fuel from the tank and follow the procedure below:

1. Remove the glow plug.
 2. Open the carburetor.
 3. Spray WD-40 into the open carburetor.
 4. Apply the starter to the starting cone and flush the lubricating spray out of the engine.
 5. Place a few drops of Hobbico After Run Oil (HCAP3000) into the carburetor and in the cylinder head.
 6. Apply the starter and flush the after run out of the engine. A sufficient amount will remain to coat the engine components.
 7. Prior to starting the engine, with the glow plug removed, open the carburetor, and pull fuel through the engine (choke) by placing a finger over the carburetor by spinning the flywheel. This will clear the after run oil.
 8. Remove the flex cable and inspect for broken strands of wire or kinks. Grease the cable and reinstall in lower unit.
- Note:** You will need to refer to your engine's manual for information regarding this procedure.

RACING

Although it is very enjoyable to go out and run the Top Speed 2 by yourself, the real fun and excitement of R/C boating is experienced when you get involved in racing. Racing against other boats is much different than running your boat alone. The following suggestions will hopefully provide helpful strategies when racing a model tunnel boat.

A good set-up for running alone may not be the best for racing conditions. Race water conditions create challenges

different from running alone and water conditions constantly change during a race. Five or six boats racing against one another will create rough water conditions on the race course and to successfully compete in racing situations, it may be necessary to "tighten" the ride characteristics. This can be accomplished by lowering the depth of the propeller or adding additional weight to the front of the boat.

Wakes caused by other boats can upset the balance and ride characteristics of even a well trimmed model boat. When running down the straight-aways, don't follow in another boat's wake. Wakes generated by other boats while entering and negotiating a corner are especially dangerous. Cutting across a wake when entering a corner can cause the boat to "hook" (pin to the inside) and stall.

Racing other boats through a corner presents possibly the greatest challenge and the first corner after the start of a race can be especially challenging. The boat entering the corner first has the task of holding its position (often called "holding your lane") through the corner and following boats must then attempt to hold their lanes. Changing lanes and crossing a wake to gain a position in a turn can result in "hooking" the boat and elimination from that race. Executing a good start in the inside lane is one key to successful racing.

Avoid beating yourself. In any type of racing, there are some situations you can control and other situations that you cannot control. The ability to set the needle-valve on the engine so it runs the entire race without stopping, checking the linkages, fasteners, fuel tubing, amount of fuel, glow plug, and radio system are conditions/situations that can be dealt with prior to the start of a race. During the race, making a good start and driving defensively are controllable actions. By focusing on tasks and actions that can be controlled, successful racing outcomes can be achieved.

NATIONAL MODEL BOATING ORGANIZATIONS

There are three national model boating organizations in the United States and Canada:

APBA or American Power Boat Association
(RC Boat Category)
www.apba-rcboating.com

IMPBA or International Model Power Boat Association
www.impba.net

NAMBA or North American Model Boat Association
www.namba.com

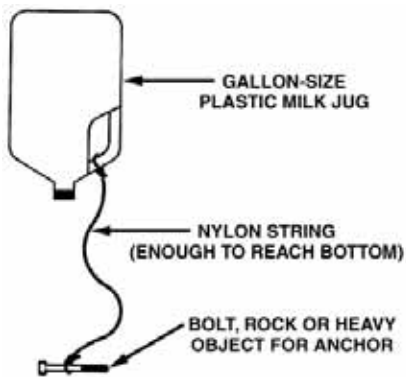
Each of the three organizations has its own rule book governing model boat racing, sanctioned events, and recognized records. Organized model boat racing is offered at both regional and national levels. Location of clubs, race dates and locations, membership applications, and other information can be obtained through their respective websites.

All three national organizations offer both stock and modified engine classes for tunnel hulls like the Top Speed 2. Participation by those new to the hobby of model boating is possible through club events.

Another good source for information regarding all aspects of tunnel boat operation is: <http://www.intlwaters.com/>

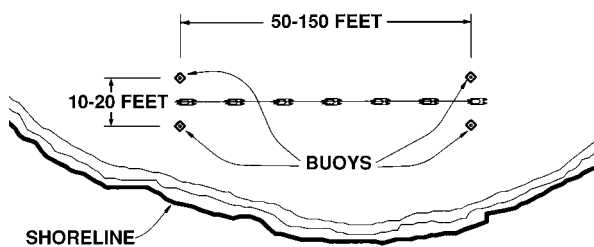
Of course, racing does not have to be an organized and sanctioned competition to be fun. Small informal races can be very exciting without the stress that comes with formal events.

Here are some suggestions for setting up a simple race course for boats:



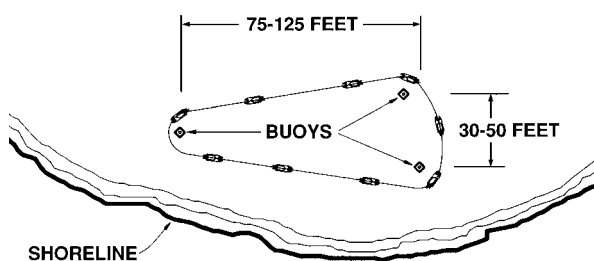
- Make 2 to 4 simple and inexpensive “marker buoys” with empty milk jugs, string, and heavy objects for anchors, similar to the above sketch.

SAMPLE “DRAG RACING” COURSE



- For “drag racing” place the buoys similar to the above sketch.

SAMPLE “OVAL” RACE COURSE



- For “oval racing” place the buoys similar to the above sketch. **Note:** The above patterns are not based on any sort of official standards; therefore, you may set up race

courses any way you desire, using your imagination to make the races more interesting. Usually the smaller courses will provide more action and excitement.

The length of the races can be determined by a set number of **laps** around the buoys (for example, the first boat to complete 5 laps is the winner); or by **time** (for example, whoever is leading at the end of two minutes is the winner).

PERFORMANCE TIPS

FUEL

In April of 2000, designer of the Top Speed 2, Jerry Dunlap, conducted a comparison test using varying percentages of nitromethane fuel. Results were obtained running a model tunnel boat (not the Top Speed 2) with a K&B 3.5ss engine and an Octura X442 propeller against a radar gun. The only variable was the percentage of nitromethane in the fuel. The fuel was of the same brand and lubrication content.

It was found that the percentage of nitromethane in a fuel affects engine performance.

Nitro %	Top Speed (mph)
10%	37/38
20%	39/40
45%	42
55%	43
65%	44

- The individual running “just for fun” might consider running lower nitro content. The cost of a gallon of model engine fuel is proportionate to its level of nitro.
- The use of fuel with a higher content of nitromethane than the recommendations made by the manufacturer may void your warranty.
- Using fuel with high levels of nitromethane may significantly decrease the life of your engine.

RUNNING THE TOP SPEED 2

PLEASE READ these valuable running tips as well as the “Safety Precautions” at the beginning of this manual **BEFORE** Running the Top Speed 2 to ensure a successful and safe run.

- **NEVER** attempt to swim after a stalled or capsized boat! Wait patiently for the wind currents to return the boat to shore or use a tennis ball attached to the end of a fishing rod to retrieve a stalled or capsized boat.
- **NEVER** threaten wildlife with any R/C vehicle! This is the quickest way to get R/C boating banned from your favorite local pond.

- Before running your Top Speed 2, it is a good idea to **check the water-cooling system** to make sure all tubes are properly connected and unblocked.
- **Check over all screws** to make sure they are securely fastened.
- Periodically remove the drive shaft and re-lube with a thin coat of petroleum jelly or light grease. (Refer to your engine's manual for the correct procedure)
- Slowly advance the throttle to full speed and note if the boat has a tendency to turn right or left. Adjust the steering trim knob on your transmitter until the boat runs in a straight line when the steering wheel is at neutral.
- **CAUTION:** Windy conditions cause rough water that will affect the performance of your Top Speed 2 and increase the chances of capsizing.
- Total run time of the Top Speed 2 is approximately 10-12 minutes (assuming you begin with a full tank of fuel). When you notice an increase in power, it means the fuel tank is nearly empty and it's time to head for shore. As soon as the boat reaches shore, stop the engine by pushing forward on the throttle trigger; turn off the receiver, and finally the transmitter (in that order).
- **CAUTION!** The engine will be hot! Allow it to cool for a few minutes before restarting.
- Your Top Speed 2 may take on small amounts of water, especially when running in rough water and when making tight turns. Keep a roll of paper towels handy and dry out the hull interior after every run. If you notice excessive amounts of water in the hull, check for leaks, especially around the hull/deck joint. You may reseal the joint using medium cyanoacrylate (CA) glue.
- Always store your Top Speed 2 with the canopy /hatch cover and radio box cover removed to allow the interior to dry out completely. If you neglect to do this, it may result in corrosion of the electronic components.
- **IMPORTANT:** If, for whatever reason, your boat takes on a large amount of water, swamps or sinks, causing the radio equipment to get wet, you must do the following immediately: Remove the battery pack and radio equipment from the boat. Allow the components to air dry completely. Reinstall the components and check for proper operation before running the boat in water.

THE WAITING GAME

If your Top Speed 2 should happen to stall or capsize, water currents will *slowly* carry it to shore. The bad news is that the boat could be carried to the opposite shore. Keep variables like wind direction and size of the lake in mind when surveying areas to run your boat.

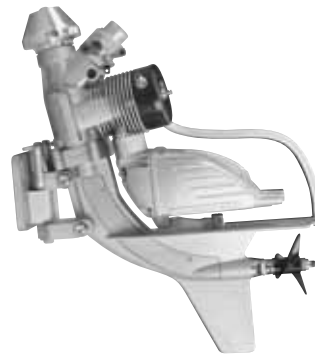
It is not advisable to run R/C boats on any free-flowing bodies of water such as creeks or rivers.

HELPFUL TIP

Use a fishing rod with at least 12lb. line and a tennis ball tied to the end to retrieve a stalled or capsized model boat.

GOOD LUCK AND GREAT BOATING!

OTHER ITEMS AVAILABLE FROM AQUACRAFT



O.S. Engines .21 XM Marine Outboard Engine

Legal for NAMBA and IMPBA racing, the water-cooled .21 XM features a muffler pressure system that ensures a steady flow of lubricating oil to the flex shaft and bearings. The ultra-quiet muffler is detachable, to ease maintenance and simplify

conversion to an optional tuned pipe. Glow plug and prop included. **OSMG1721**



Futaba 2PL 2-channel Computer Radio

One-button programming makes this one a great radio. Besides its computer sophistication, the 2PL is packed with high-performance features – and designed for simplicity in setup and control. High-tech advantages include: steering and throttle trims,

steering dual rate, 10-model memory, steering and throttle EPA (End Point Adjustment), ABS braking and more. Comes with an S3003 servo and R142LE receiver, and operates on 75MHz. **FUTK01****

AQUACRAFT

Models

by **HOBBIKO®**

ORDERING REPLACEMENT PARTS

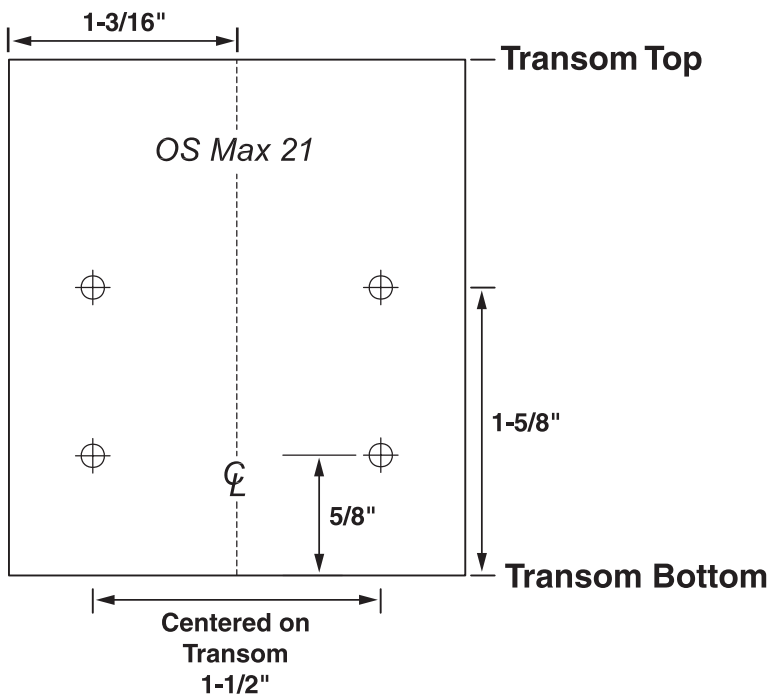
To order replacement parts for the AquaCraft Top Speed 2, use the order numbers in the **Replacement Parts List** that follows. Replacement parts are available only as listed and can be purchased from hobby shops or mail order/ Internet order firms. Hardware items (screws, nuts, bolts) are also available from these outlets. If you need assistance locating a dealer to purchase parts, visit www.aquacraftmodels.com and click on "Where to Buy." If this kit is missing parts, contact **Hobbico Product Support**.

Replacement Parts List

Order #	Item	Order #	Item
HCAB6704	Rubber Drain Plug	HCAB6703	Antenna/Cable Seal Boot (2)
HCAB9042	Recovery Pads	HCAB6702	Receiver Waterproof Balloon (2)
HCAB6700	Waterproof Switch Boot w/ON-OFF Plate	HCAB8603	Radio Box Foam
HCAB8602	Assembled 3-channel Radio Box	HCAB6217	Fiberglass Cowl (White)
HCAB6701	Radio Box Water Seal Boot (2)	HCAB6313	Decal Set (All)
HCAB7008	Pushbutton Cowl Locks (2)	HCAB7802	L-Link Pushrod Connector (2)
HCAB7102	TS2 Display/Set-up Stand	HCAB8606	Radio Box Waterproof Tape
HCAB6218	Cowl Body Clip w/washer (2)	HCAB3000	Speed Grease Driveline Cable Lube
HCAB8604	Antenna Tube w/cap	GPMQ4103	8oz. Fuel Tank

ENGINE TEMPLATES

Template #1



Template #2

