Sport Float Kit ARF

INSTRUCTION MANUAL

WARRANTY

Great Planes® Model Manufacturing Co. guarantees this kit to be free from defects in both material and workmanship at the date of purchase. This warranty does not cover any component parts damaged by use or modification. **In no case shall Great Planes' liability exceed the original cost of the purchased kit.** Further, Great Planes reserves the right to change or modify this warranty without notice.

In that Great Planes has no control over the final assembly or material used for final assembly, no liability shall be assumed nor accepted for any damage resulting from the use by the user of the final user-assembled product. By the act of using the user-assembled product, the user accepts all resulting liability.

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

READ THROUGH THIS INSTRUCTION MANUAL FIRST. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.

GREAT PLANES®
MODEL MANUFACTURING COMPANY

Champaign, IL 61822
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INTRODUCTION

Thank you for purchasing the Great Planes ARF Sport Floats. During our flight testing with these floats, we were amazed by the superb handling characteristics on the water and the ultra-smooth, realistic takeoffs and landings.

While the Great Planes ARF Sport Floats were designed for the .40 size Great Planes Piper J-3 Cub ARF, they will work well with other models, too. Although the Great Planes Cub ARF is used as an example, the same procedures and guidelines apply if you are installing your floats on a different model.

You will discover that the Great Planes ARF Sport Floats are easily installed, often in just one hour. All of the parts you need are included in this kit.

PROTECT YOUR MODEL, YOURSELF & OTHERS...FOLLOW THESE IMPORTANT SAFETY PRECAUTIONS

1. Your Great Planes ARF Sport Floats and model should not be considered a toy, but rather a sophisticated, working model that functions very much like a full-size airplane. Because of its performance capabilities, the ARF Sport Floats and model, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.

2. You must assemble the Sport Floats **according to the instructions**. Do not alter or modify the floats, as doing so may result in an unsafe or unflyable model. In a few cases the instructions may differ slightly from the photos. In those instances the written instructions should be considered as correct.

3. You must use an R/C radio system that is in first-class condition, and a correctly sized engine and components (fuel tank, etc.) throughout the building process.

4. You must correctly install all R/C and other components so that the model operates correctly on the ground, on the water and in the air.

5. You must check the operation of the model before **every** flight to insure that all equipment is operating and that the model has remained structurally sound. Be sure to check clevises or other connectors often and replace them if they show any signs of wear or fatigue.

6. If you are not already an experienced R/C pilot, you should fly the model only with the help of a competent, experienced R/C pilot.

7. You should have a boat available to retrieve your model. Do not attempt to swim after your model.

Remember: Take your time and follow the instructions to end up with a well-built model that is straight and true.

If you have not flown this type of model before, we recommend that you get the assistance of an experienced pilot in your R/C club for your first flights. You'll learn faster and avoid risking your model before you are truly ready to fly it. Your local hobby shop has information about clubs in your area whose membership includes experienced pilots.

In addition to joining an R/C club, we strongly recommend you join the AMA (Academy of Model Aeronautics). AMA membership is required to fly at AMA sanctioned clubs. There are over 2,500 AMA chartered clubs across the country. Among other benefits, the AMA provides insurance to its members who fly at sanctioned sites and events. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. Contact the AMA at the address or toll-free phone number below:

AMA
SINCE 1936

Academy of Model Aeronautics
5151 East Memorial Drive
Muncie, IN 47302-9252
Tele. (800) 435-9262
Fax (765) 741-0057
Or via the Internet at: http://www.modelaircraft.org

POINTS TO CONSIDER

For steering your model on the water, a water rudder will be installed on the right float. The water rudder can be connected to the aircraft rudder by a pushrod, or a servo can be installed inside the float. All parts required for either type installation are included with this kit (servo not included).

We highly recommend that you install a servo inside the float. It is easy to do and it makes installation/removal of the floats on the aircraft easier.

Floats increase the weight of the model they are installed on. In addition, water drag and surface tension increase the amount of power required for takeoff. In-flight drag is also greatly increased.

If your model had "adequate" power before floats are installed, it will likely be very marginally powered with the floats. It is recommended that you use an engine in the upper end of the recommended power range with these floats.

For the .40 size Great Planes Piper J-3 Cub ARF, we recommend an O.S.® .46 FX 2-stroke or an O.S. FS 70 4-stroke engine.

PREPARATIONS

Adhesives & Building Supplies

❏ 1/2 oz. [15g] Thin Pro™ CA (GPMR6001)
❏ 1/2 oz. [15g] Medium Pro CA+ (GPMR6007)
❏ Pro 6-minute epoxy (GPMR6045)
❏ 2-56 Tap and Drill (GPMR8100)
❏ Stick-on segmented lead weight (GPMQ4485)
❏ #1 Hobby knife (HCAR0105)
❏ #11 blades (5-pack, HCAR0211)
❏ Clear waterproof tape
❏ Drill bits: 1/16" [1.6mm], 5/64" [2mm], 1/8" [3.2mm]. (25/64" or 3/8" [9.9 or 9.5mm] for optional servo installation.)
❏ Razor saw

Optional Supplies & Tools

❏ 2 oz. [57g] spray CA activator (GPMR6035)
❏ CA applicator tips (HCAR3780)
❏ CA debonder (GPMR6039)
❏ Mixing sticks (50, GPMR8055)
❏ Mixing cups (GPMR8056)
❏ Pliers with wire cutter (HCAR0630)
❏ Denatured alcohol (for epoxy clean up)
❏ Z-bend pliers (HCAR2000)
❏ Rotary tool such as Dremel®
❏ Rotary tool reinforced cut-off wheel
❏ Servo horn drill (HCAR0698)
❏ CG Machine™ (GPMR2400)

Hardware & Accessories

For internal servo:

❏ (1) standard servo
❏ (1) 12" [300mm] servo extension
❏ (1) Y-harness

Parts Identification

Before starting to build, use the **Parts Identification** list to 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 on this page.

Great Planes Product Support:
Telephone: (217) 398-8970
Fax: (217) 398-7721
E-mail: airsupport@greatplanes.com

Important Building Notes

Before starting assembly, assemble the model and mark the balance point of the model. You will need to know this later when the model is balanced with the floats installed.

If you are not going to install a servo inside the float, skip the following section and go to "Assemble the Water Rudder" on page 6.
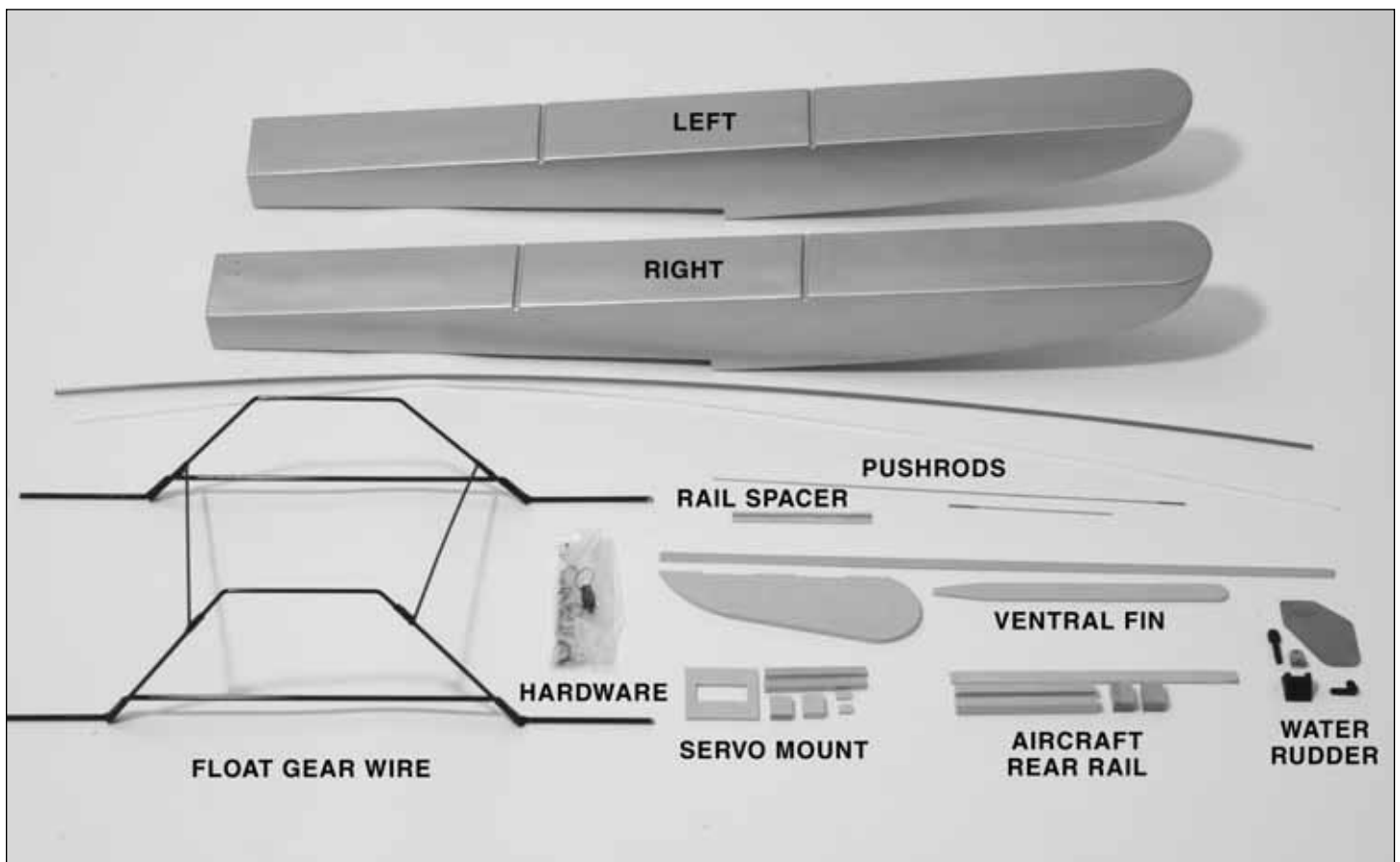

Hardware bag contents:
(3) SMALL NYLON TIE STRAP
(3) FLAT LANDING GEAR STRAPS, TREE OF 4
(34) #4 X 1/2" PHILLIPS HEAD SHEET METAL SCREW
(4) WHEEL COLLAR SET SCREW
(4) 5 mm WHEEL COLLAR
(35) #4 FLAT WASHER
(1) 2-56 HEX NUT
(1) 4-40 LOCK NUT
(4) #62 RUBBER BAND
(1) 2-56 X 3/8" PHILLIPS HEAD SHEET METAL SCREW
(1) 4-40 X 1/4" SOCKET HEAD CAP SCREW

(3) 2-56 X 1/2" PHILLIPS HEAD MACHINE SCREW
(1) BRASS BODY FOR SCREW-LOCK CONNECTOR
(1) NYLON RETAINER
(1) FASLINK
(1) RUBBER BOOT
(1) 4-40 x 1/8" SOCKET HEAD CAP SCREW
(1) LARGE NYLON CONTROL HORN
(1) 5/32" GEAR HUMP STRAP, TREE OF 4
(2) NYLON CLEVIS
(2) SILICONE CLEVIS RETAINER
(1) 2-56 X 1" ROD THREADED FULL LENGTH
(1) 2-56 x 6" THREADED ONE END WIRE

Install the Steering Servo
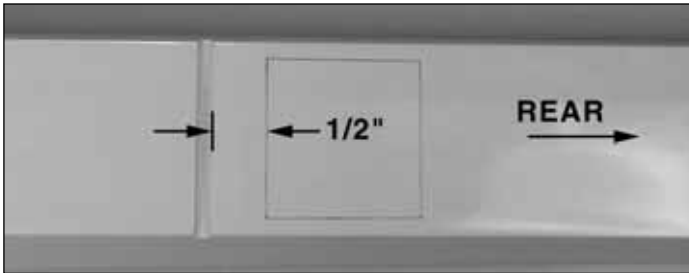
❏ 1. Use the servo tray to mark the outline of the tray on one of the floats with a fine-tipped marking pen as shown in the photo above. The tray should be located 1/2" [13mm] aft of the rear groove in the float. This float is now the right float.


❏ 2. Very carefully cut the marked area from the float with a razor saw. The piece you cut out will be used as the tray cover, so use care not to damage it. Mark the end of the cover that was facing forward.
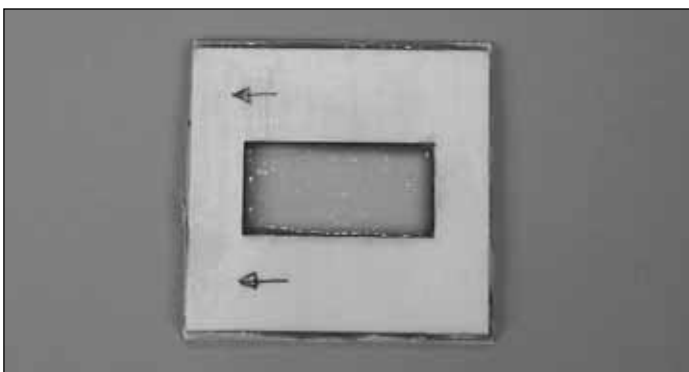

❏ 3. Glue the servo tray to the inside of the cover with epoxy. Use some medium grit sandpaper to rough up the inside of the cover first. Mark the tray indicating which end of the cover faces forward.

**Note**: The tray may not have the cutout shown in the above photo.
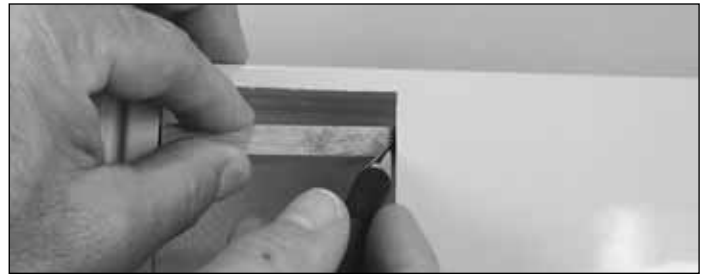
❏ 4. Clean any resin residue from the tray opening in the float. Trim any resin from the hardwood mounting rail inside the float. Put one of the 1/4" x 3/8" x 3-1/2" [6.4 x 9.5 x 89mm] basswood **servo tray rails** in the float, butting one end against the mounting rail. Mark the rear of the opening on the rail. Transfer the mark to the other rail as well.
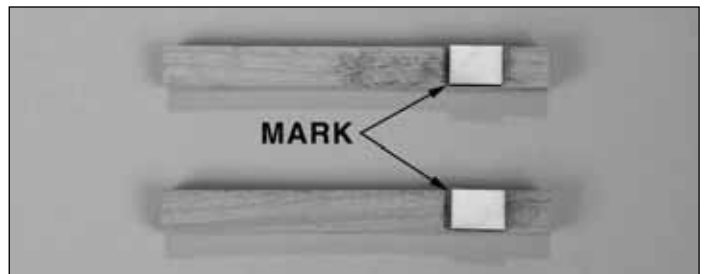
❏ 5. Glue a 1/8" x 3/8" x 1/2" [3.2 x 9.5 x 12.7mm] ply **rail spacer** to each of the servo tray rails as shown in the photo. In the photo, the mark is to the left of the spacers.
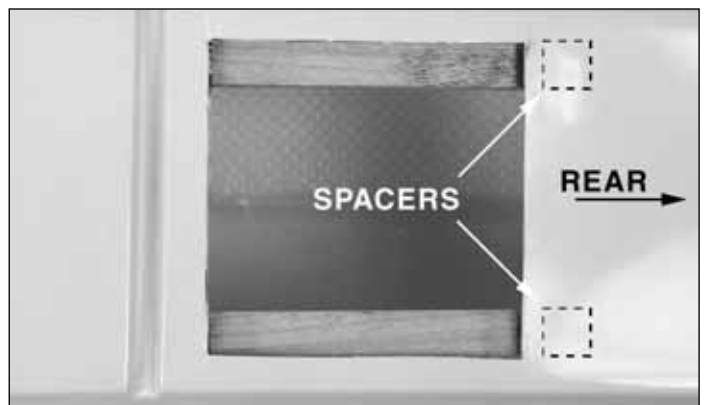

❏ 6. Using medium CA, tack glue the servo tray rails into the float opening with the spacers toward the rear of the float. Scuff the area with some medium grit sandpaper to improve the adhesion.
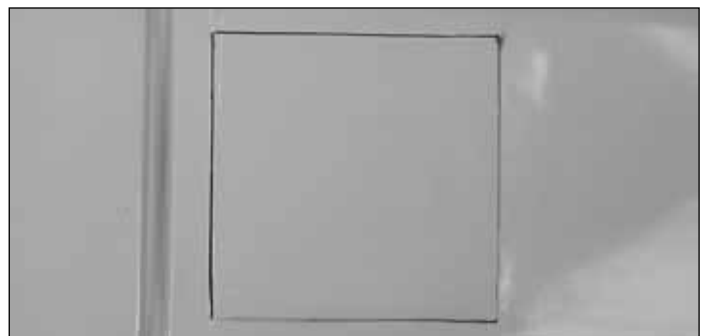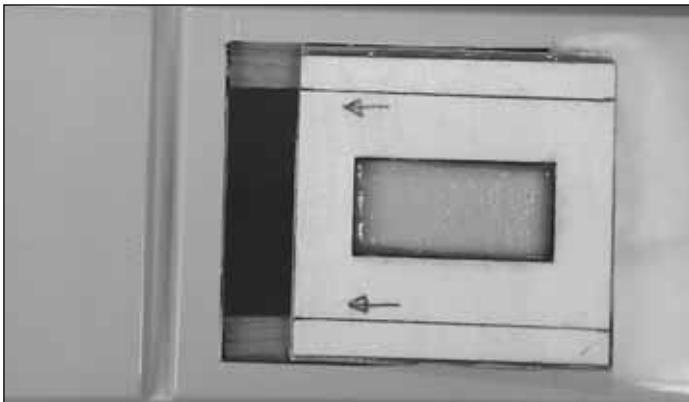

❏ 7. Trial fit the servo tray to the top of the rails. If the tray sticks up above the top of the float, remove the servo tray
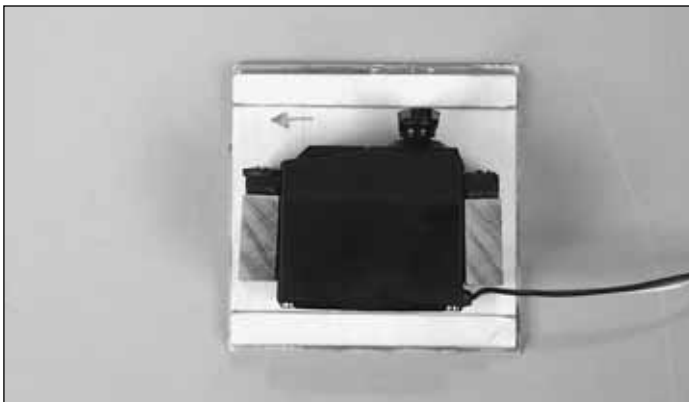
rails and make some shims from leftover ply. Tack glue the servo tray rails in place again and check the fit of the servo tray. When satisfied with the fit, use 6-minute epoxy to glue the rails permanently in place.
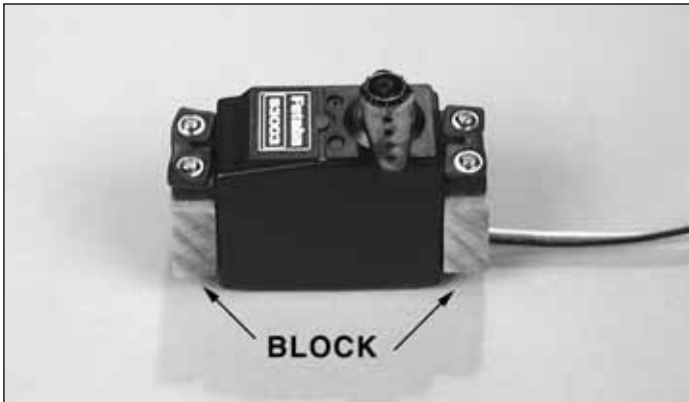
❑ 8. Mount the servo to the 5/16" x 3/4" x 7/8" [8 x 19 x 22.2mm] basswood blocks, using the hardware supplied with the servo. Make sure the servo is oriented as shown in the photo with the servo arm pointing as shown. The edge of the block should extend past the rear side of the servo slightly. See the photo at step 10.
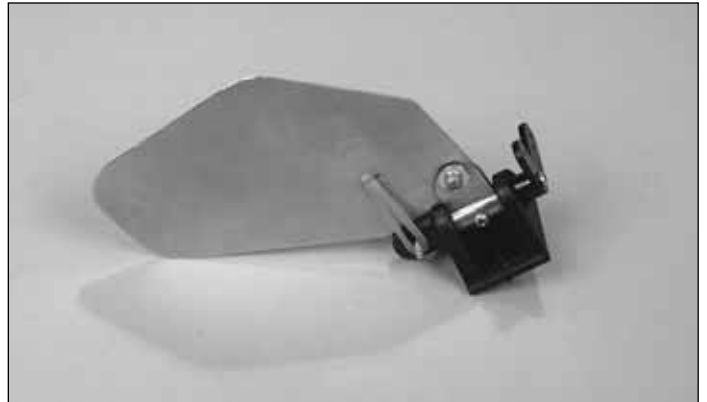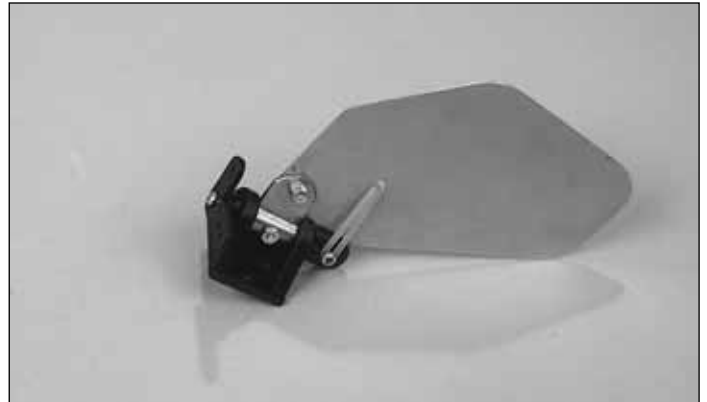

❑ 1. If your water rudder is already assembled, proceed to step 7. Otherwise, refer to the above photos as you assemble the water rudder.

❑ 9. Position the servo tray as shown and mark the location of the mounting rails.

❑ 2. Drill two 1/8" [3.2mm] holes in the aluminum **water rudder** at the locations shown in the above photo.
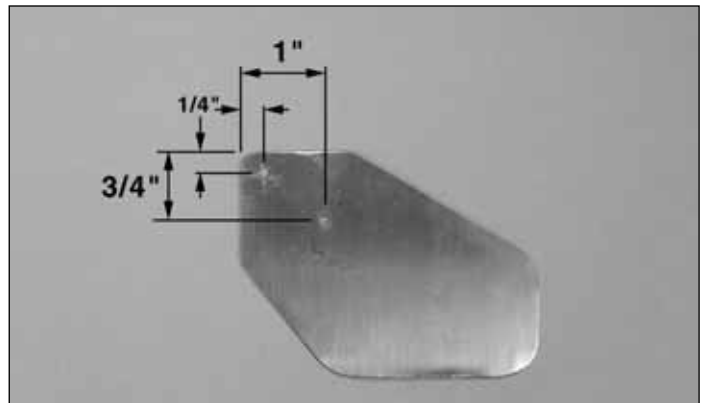

❑ 10. Use 6-minute epoxy to glue the basswood blocks to the servo tray, with the servo attached. The servo should be centered between the lines marking the location of the rails. After the epoxy has cured, install the tray into the opening in the float and make sure it fits properly.

❑ 3. Drill and tap a 2-56 hole in the **nylon rudder post** at the location shown in the above photo. Install the 2-56 x 1/2" [12.7mm] screw in the hole.

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❏ 4. Assemble the **Nylon rudder bearing,** rudder post, **aluminum bracket** and **nylon control horn** as shown in the photo. Hold the control horn in place with a #2 x 3/16" [4.8mm] screw.

❏ 5. Assemble the water rudder to the aluminum bracket with a 4-40 x 1/4" [6.4mm] **socket head cap screw** and 4-40 **lock nut**. Tighten the nut, but leave it loose enough that the water rudder can pivot freely in the bracket. If the bracket does not have a hole drilled in it, use a 1/8" drill to drill the hole.

DRILL 5/64" HOLE
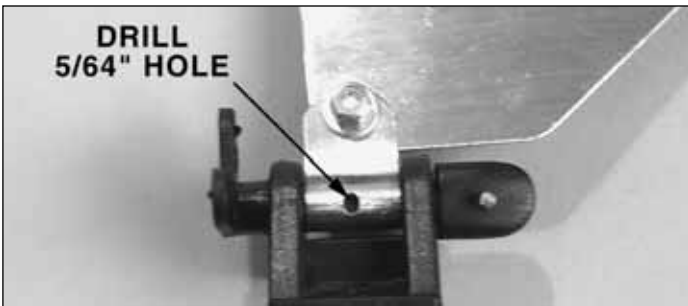
❏ 6. Drill a 5/64" [2mm] hole in the aluminum bracket and rudder post at the location shown in the above photo,

making sure the water rudder and control horn are aligned as shown. Install a 2-56 x 3/8" [9.5mm] screw and 2-56 nut to hold the bracket to the rudder post. Use Great Planes Pro Threadlocker™ to hold the nut in place.
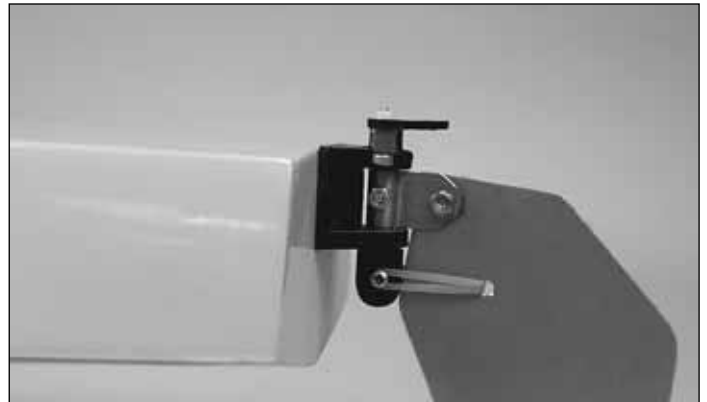
Hint: Center punch the bracket before drilling the hole.

❏ 7. Install a **screw-lock connector, nylon retainer and 4-40 x 1/8 [3.2mm] socket head cap screw** in the outer hole of the long tiller arm on the water rudder. Also install the rubber band.
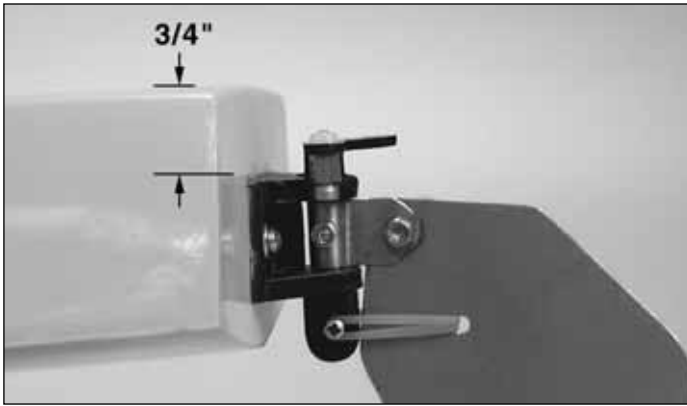
Install the Water Rudder

If you are installing a servo inside the right float, proceed to step 2.

❏ 1. Do this step only if you are installing a pushrod from the aircraft rudder to the water rudder. Mount the water rudder assembly in the location shown in the above photo. The top of the mounting bracket should be even with the top of the float, on the centerline of the transom (rear of the float). Mark the location of the holes in the mounting bracket on the transom. Drill a 5/64" [2mm] hole at the marked locations and mount the water rudder assembly to the transom with two #4 x 1/2" [12.7mm] sheet metal screws and two #4 flat washers.

❑ 2. Mount the water rudder assembly in the location shown in the above photo. The top of the mounting bracket should be 3/4" [19mm] from the top of the float, on the centerline of the transom (rear of the float). Mark the location of the holes in the mounting bracket on the transom. Drill a 5/64" [2mm] hole at the marked locations and mount the water rudder assembly to the transom with two #4 x 1/2" [12.7mm] sheet metal screws and two #4 flat washers.
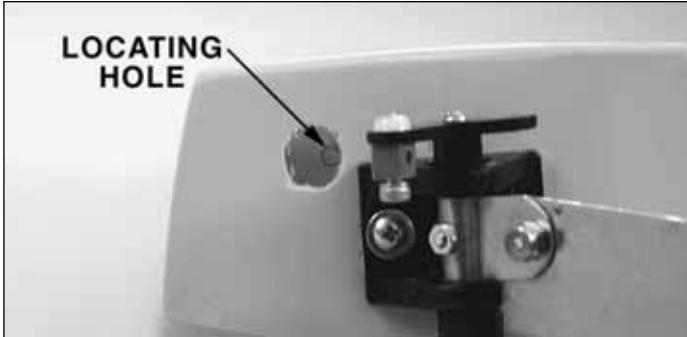
❑ 3. Drill a 25/64" [9.9mm] hole in the transom of the float as shown. This hole must be drilled very carefully as there is a wood block installed in the transom for mounting the water rudder assembly. If the hole is drilled too close to the water rudder assembly, the drill bit will catch on the edge of the wood block, causing the drill bit to twist sideways. Hold the float up to a strong light so that you can determine where the edge of this block is located. Drill the hole as close to the water rudder assembly as possible, while still missing the wood block. If you can't locate the edge of the wood block, drill a locating hole as noted in the photo. If the locating hole hits wood, drill another hole farther over.

Note: If you don't have a 25/64" [9.9mm] drill use a 3/8" [9.5mm] drill, and then slightly enlarge the hole with a hobby knife.

❑ 4. Cut the .074 x 17-1/2 [445mm] **wire pushrod** to a length of 12" [25.4mm]. Cut the threaded portion of the wire off, leaving a 12" [25.4mm] wire with no threads. Make a small bend 3/4" [19mm] from the end of the wire. Insert the wire into the **rubber bushing**.


❑ 5. Insert the wire and rubber bushing into the hole you drilled in the transom. The rubber bushing is easier to insert if you stretch it on the wire as it is inserted. Use a screwdriver to carefully poke it through as needed. The rubber bushing is now inside the float. Secure the rubber bushing to the transom with some silicone rubber glue or medium CA. Insert the wire into the screw-lock connector.
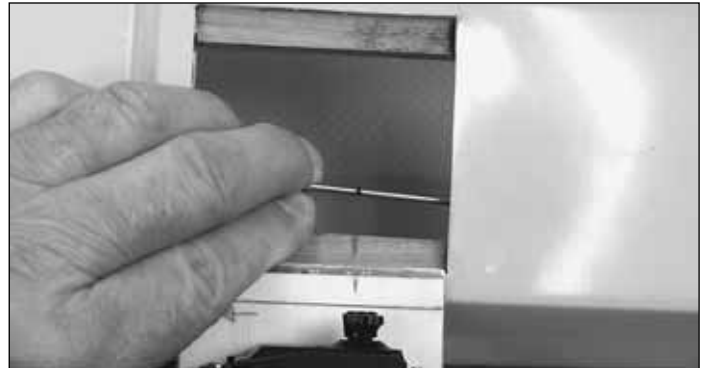
❑ 6. Mark the location of the hole in the servo arm on the servo mounting rail and on the wire pushrod. Make sure that the water rudder is centered and the pushrod is centered in the screw-lock connector.

❑ 7. Make a 90-degree bend in the wire at the mark. The bend should face the right side of the float as shown in the photo. Enlarge the middle hole of the servo arm with a 5/64" [2mm] drill. Insert the pushrod into the servo arm and secure it with a **Faslink** connector. Remove the screw and servo arm from the servo. Plug the servo into the receiver and center the trims on the transmitter. Turn the radio on, and then push the servo arm onto the servo with the arm at 90 degrees to the servo. Install the mounting screw into the servo arm. Turn the radio off and unplug the servo.
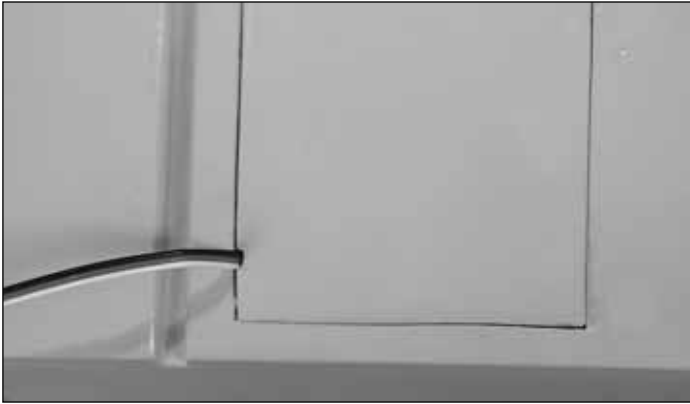
❏ 8. Cut a small notch in the servo hatch for the servo extension wire. Install a 12" servo extension wire on the servo lead. Secure the connection with tape, keeping the connection as water tight as possible. Position the servo hatch onto the rails with the taped connection inside the float. Secure the hatch into place with some clear waterproof tape. Put a dab of silicone glue where the servo wire exits the hatch to waterproof it.

POSITIONING OF FLOATS

Before you continue, take a break from building and study the following information to be sure you understand the positioning of the floats in relation to the wing and fuselage.

While the following instructions show the Sport Floats on Great Planes Piper Cubs, there are general tips and guidelines that apply to all models which will insure proper handling characteristics in the water and good landing and takeoff tendencies.

FLOAT STEP IS 1/2" BEHIND C.G.
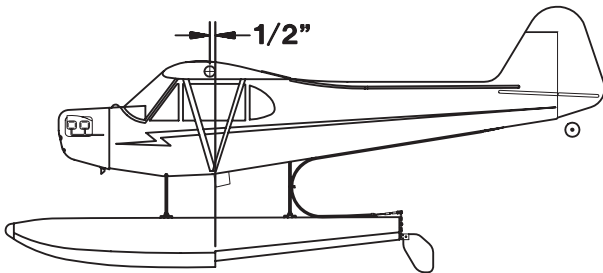
The relationship between the "step" on the floats and the center of gravity on the model is important. First, the floats should be mounted on the model so the step is positioned as detailed in the "Step Sketch" for your particular model. Then, when the floats are mounted on the model, move the C.G. slightly forward as listed below. Although you may have added the recommended ballast inside the front of the float, in some cases a little more ballast may be required on the model.

• **For 60-size floats:** Move the CG (Balance point) 1/2" ahead of the manufacturers recommended CG.
• **For 40-size floats:** Move the CG (Balance point) 3/8" ahead of the manufacturers recommended CG.
• **For 20-size floats:** Move the CG (Balance point) 9/32" ahead of the manufacturers recommended CG.
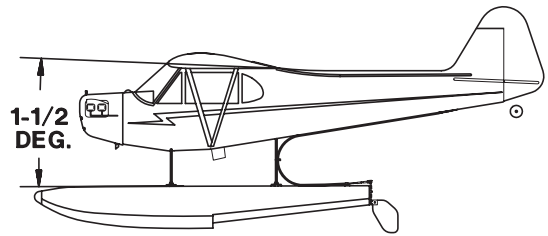
**GREAT PLANES PIPER CUB .40
ON FLOATS**
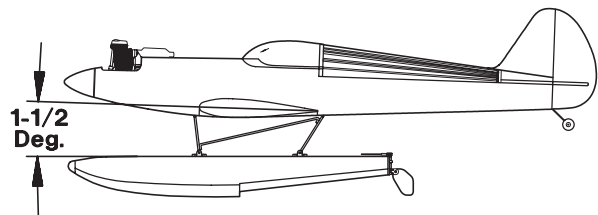
**WHEN THE TOPS OF THE FLOATS ARE LEVEL,
THE WING INCIDENCE SHOULD BE +1-1/2 deg.**

Another important relationship between the wing and the floats is the relative "angle of attack." With a virtually flat bottom wing such as a Piper Cub, the deck of the floats should be parallel to the bottom of the wing. Since the Cub does not have a truly flat wing, this yields a slight positive wing incidence in relation to the floats, and the airplane will tend to rise off the water at the correct time. If you have a model with a symmetrical wing, the wing incidence in relation to the float deck should be positive 1-1/2 degrees.
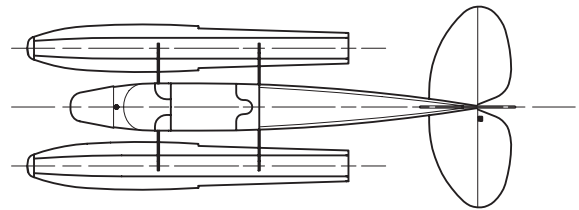
**THE CENTERLINES OF THE FLOATS
AND MODEL MUST BE PARALLEL**

Finally, each float should be set so that it is parallel to the centerline of the fuselage.

9
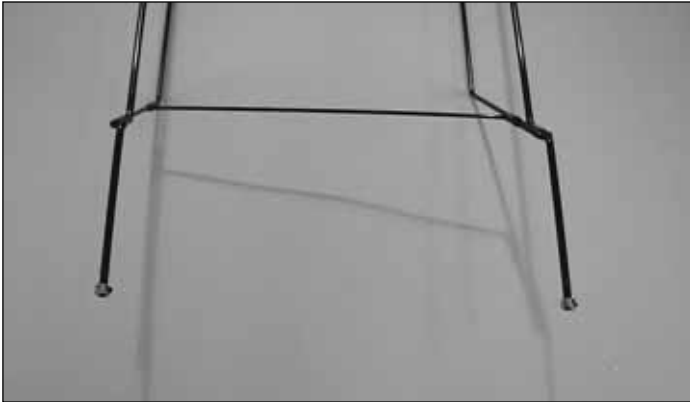
❑ 1. Install a 5mm wheel collar and set screw on each of the four ends of the float gear wires. The photo shows the two right ends of the gear wires.

You must now determine how the floats will be mounted to your model. In most cases, you will be able to use the existing landing gear mounting block, already installed in your model, for the front mount of the float wires. You will probably need to install a rear mount, however.

If you are installing the floats on a recently produced Great Planes J-3 ARF (fabric covered), the model may already have the rear mount installed. Other models will require that you install a rear mounting block.
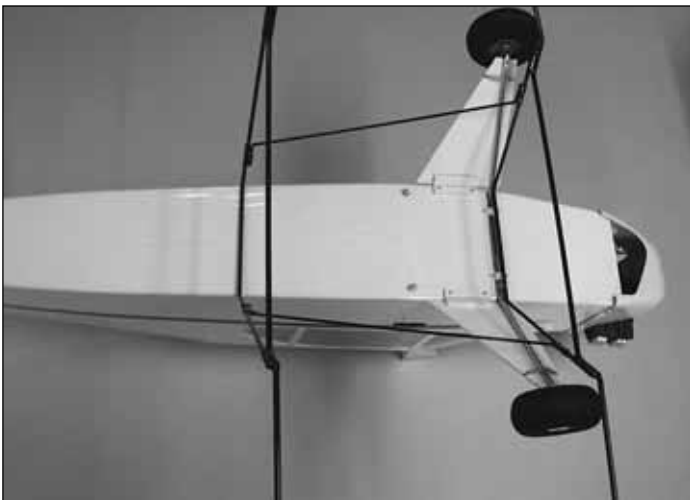

❑ 2. Place the fuselage of your model on your work bench, upside down. Place the float gear wires on the fuselage. Determine if there is a rear mounting block in your model. If there is, cut the covering from the groove in the block, then proceed to "Install the Float Gear Wires" on page 11.
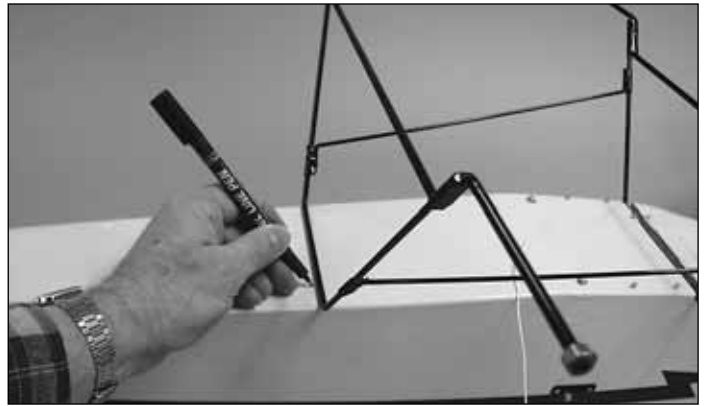

❑ 3. If there is no rear mounting block, you must install one. Remove the landing gear from your model. Place the float gear wires on the model and mark the location of the rear float wire. Note that we have reinstalled as many of the screws, etc. as we could, so as not to lose them and to seal the holes in the bottom of the fuselage. In the steps that follow, we will show how we installed the mounting block in the Great Planes J-3 ARF. Your model may require some changes.

❑ 4. Check for a former inside the fuselage in the location you have marked. Use a pin to poke through the bottom of the fuselage and locate the edge of the former. Notice in the photo how the mounting block will fit against the former. Do not be concerned if your model does not have a former that is so conveniently located.
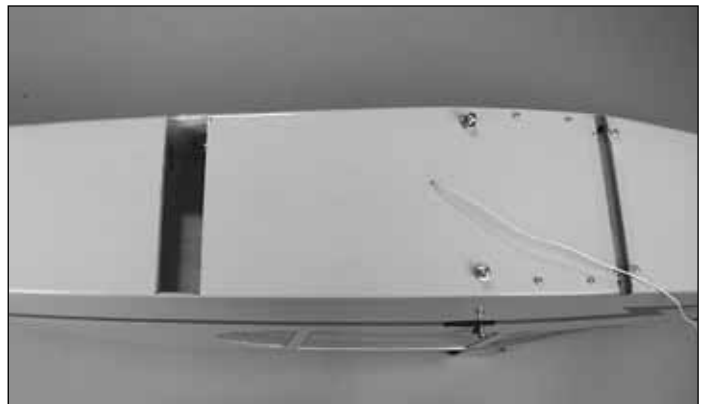
❑ 5. Mark the outline of the mounting block on the fuselage bottom so that the groove in the mounting block will be directly under the location of the wire already marked on the fuselage. Cut the covering and balsa sheeting from the fuselage at the marks. Save the covering.
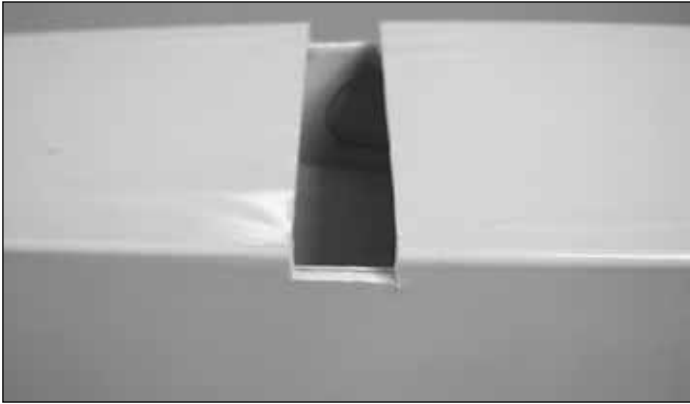
❏ 6. This fuselage has a 1/8" [3.2mm] balsa side and a 1/8" [3.2mm] ply doubler. There is also a 1/4" x 1/4" [6.4 x 6.4mm] balsa filler stick glued to the bottom sheeting and resting on the edge of the ply doubler. Cut the stick and fuselage side down to the ply doubler. Do not cut deeper than 1/2" [12.7mm], the thickness of the mounting block.
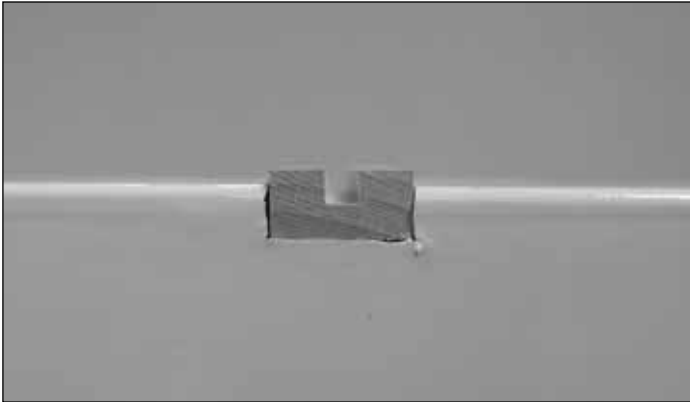
❏ 7. After cutting down to the ply doubler, the mounting block will likely protrude from the bottom of the fuselage slightly; in our case it was 1/8". Trim the fuse side and ply doubler until the mounting block is flush with the bottom of the fuselage.
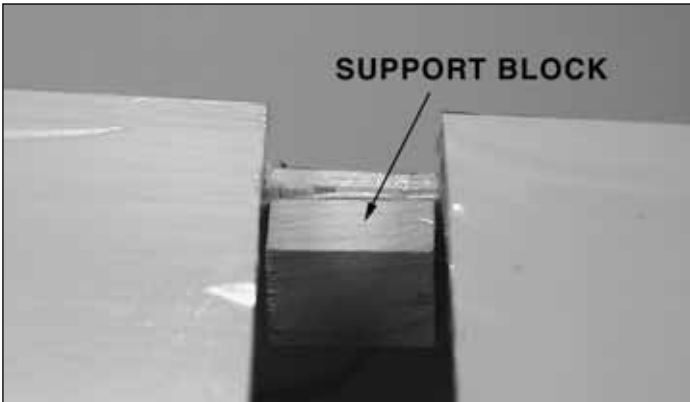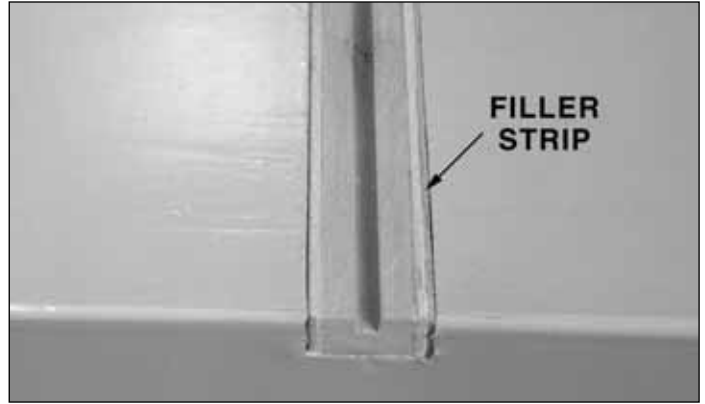

❏ 8. Using epoxy, glue the 1/2" x 3/4" x 1" [12.7 x 19 x 25.4mm] **support blocks** to the fuselage sides as shown in the photo. If your model does not have a former that the mounting block can be glued to, you should make longer support blocks to provide additional support.

FILLER STRIP

❏ 9. Using epoxy, glue the mounting block to the support blocks, fuselage sides and former. Glue a filler strip to the mounting block, if needed, so that the bottom sheeting can be glued to the mounting block.
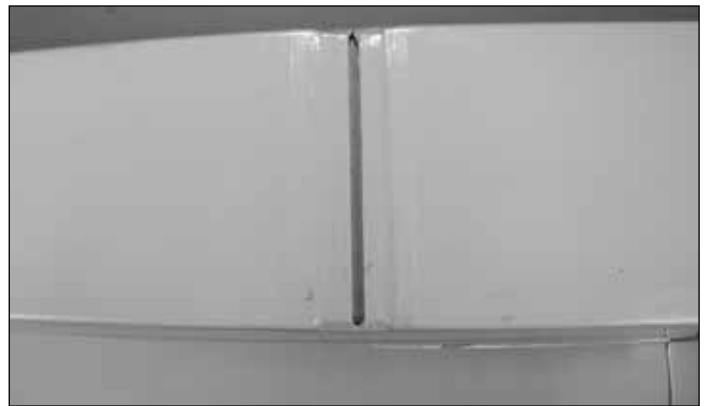
❏ 10. Use the covering that you saved to cover the mounting block and the fuselage sides. There may not be enough covering, so do the visible part of the fuselage sides first. Leftover Cub Yellow MonoKote® can be used on the bottom.

INSTALL THE FLOATS

Install the Float Gear Wires

If the landing gear is still installed on the model, remove it. Set the parts aside where you won't misplace them.

❏ 1. Install four nylon **landing gear straps** on each float using eight #4 x 1/2" [12.7mm] **sheet metal screws** and eight #4 **flat washers**. The side of the straps should be

about 3/8" [9.5mm] from the sides of the floats. Drill 1/16" [1.6mm] pilot holes for the screws.
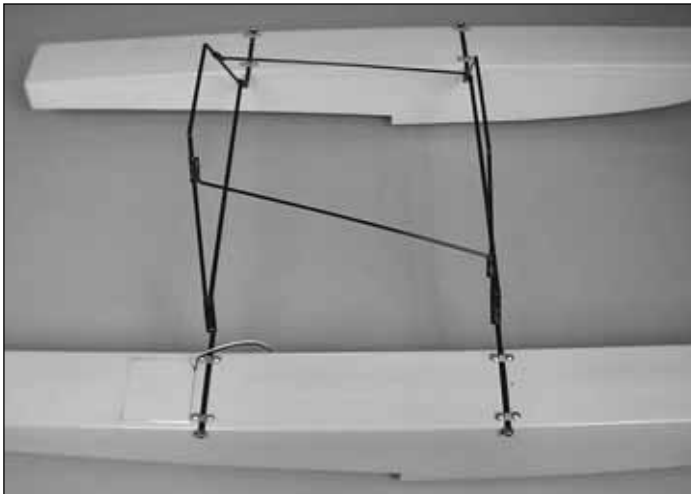

❏ 2. Mount the floats to the float gear wires, making sure the right float is on the right side. Note the orientation of the wires on the floats.

Install the Floats on the Model

❏ 1. Install two nylon landing gear straps on the rear fuselage mounting block using four #4 x 1/2" [12.7mm] sheet metal screws and four #4 flat washers. Drill 1/16" [1.6mm] pilot holes for the screws.

❏ 2. Place the floats and wires into position on the fuselage. Secure the rear wire in place with the landing gear straps.
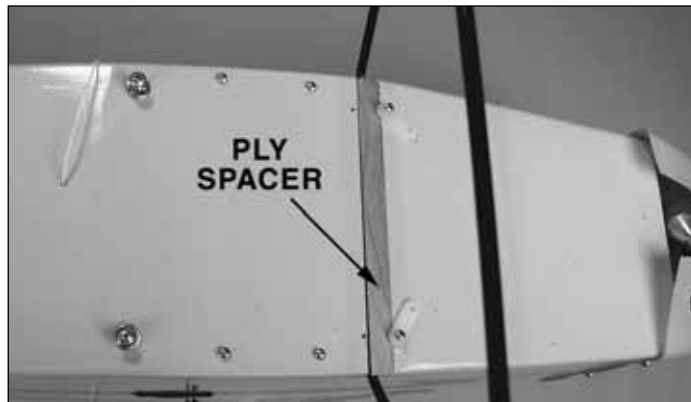
❏ 3. Waterproof the ply spacer assembly with some thin CA or paint. Install the ply spacer assembly in the front gear wire. This will prevent the forward float wire from moving in the groove. Secure the wire into place with the landing gear straps.

❏ 4. Remove all of the mounting screws from the fuselage and floats. Harden all of the holes with a couple of drops of thin CA. After the CA cures, reinstall all of the screws.

If you have not installed an internal servo, proceed to "Install the Air Rudder Pushrod" on page 13.

Connect the Float Servo

❏ 1. Plug a "Y" connector into the rudder channel on the receiver. Plug the rudder servo into one end of the "Y." Route the other end of the "Y" to the right rear float wire area.

Note: If you have a computer radio system, you could use a spare receiver channel for the water rudder servo and mix the air rudder to the water rudder servo. This would allow independent setup of the throws and trim.

❏ 2. Cut a small slot in the fuselage side for the connector.
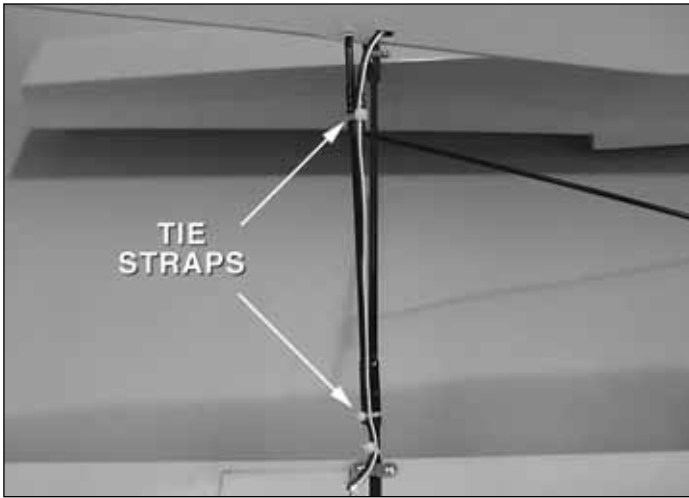
TIE STRAPS

❏ 3. Use the small nylon **tie straps** to secure the servo extension wire to the float landing gear wires. Plug the servo extension wire into the "Y" connector from the receiver.

IMPORTANT: Secure the connection with tape, keeping the connection as water tight as possible. Insert the connection into the fuselage so that it is entirely inside the fuselage. Seal the cutout and wire with some clear silicone sealant.

Continue with "Set the Water Rudder Throw."

Install the Air Rudder Pushrod

❏ 1. Install a large nylon **control horn** on the right side of the rudder as shown in the photo above. Use two 2-56 x 1/2" [12.7mm] screws and the nylon back plate to mount the horn.

❏ 2. Install a nylon **clevis**, **clevis retainer** and **2-56 x 1" [25.4mm] threaded stud** on the **inner pushrod**. Thread

the stud about 13 turns into both the clevis and pushrod. Insert the inner pushrod into the outer pushrod tubing.

❏ 3. Attach the pushrod assembly to the rear of the fuselage with a nylon **strap** and two #4 x 1/2" [12.7] screws and two #4 flat washers. Drill 1/16" [1.6mm] pilot holes for the screws. Connect the clevis to the control horn in the second hole closest to the rudder.
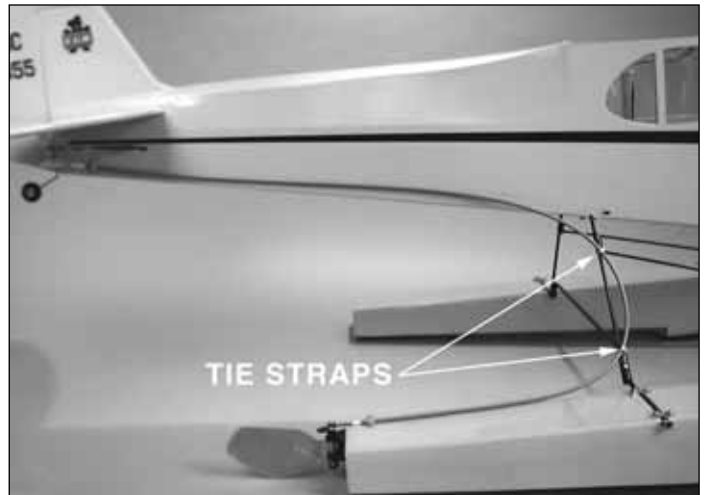
TIE STRAPS

❏ 4. Route the assembled pushrod to the water rudder. Attach the pushrod to the float landing gear wires with the small nylon **tie straps**. The above photo shows the finished installation.

USE THIS PHOTO FOR THE NEXT FOUR STEPS

❏ 5. Use the photo above as a guide in cutting the pushrod to length. With the pushrod properly positioned, mark the

pushrod 1/8" [3.2mm] from the rear of the float. Cut the inner and outer pushrods at the marked location.

❏ 6. Disconnect the pushrod clevis from the rudder control horn and pull the inner pushrod out a few inches. Cut the outer pushrod 3/8" [9.5mm] from the end (at the float end). Reconnect the clevis back to the control horn.

❏ 7. Thread the 2-56 x 6" [152mm] wire 13 turns into the inner pushrod. Insert the wire into the screw-lock connector on the water rudder control arm and cut the wire to length.

❏ 8. Attach the pushrod assembly to the rear of the float with a nylon **strap** and two #4 x 1/2" [12.7] screws and two #4 flat washers.

❏ 9. Center the rudder and tighten the screw on the screw-lock connector.

Note: Two additional nylon straps and screws are included if additional support is needed.

Set the Water Rudder Throw

❏ 1. Turn on the transmitter and receiver. With the rudder centered, adjust the water rudder linkage as needed to center the water rudder.

❏ 2. Move the rudder left and right with the transmitter stick. Make sure the water rudder responds smoothly and in the correct direction.

❏ 3. Adjust the linkage for a water rudder throw of 1" [25.4mm]. This can be done by moving the clevis to another hole on the rudder control horn (external pushrod) or by adjusting the ATV (internal servo). The amount of throw should be adjusted as needed for good water handling.

Install the Ventral Fin

Floats on a model generally add more side area forward of the CG than aft. This can create a stability problem. This kit includes a **ventral fin** that can be installed on the rear of the fuselage to increase the rearward side area. The Great Planes J-3 ARF flies well without the ventral fin. However, there is noticeably less yaw stability.

❏ 1. Remove the covering from the slots in the **ventral fin mounting base**.
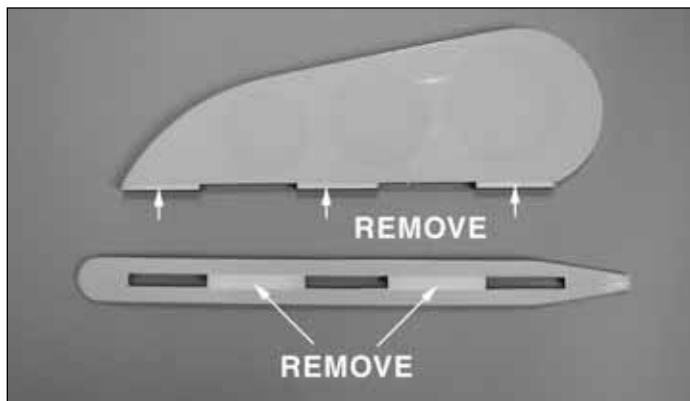
❏ 2. Insert the **ventral fin** in the mounting base. Mark the fin where it meets the mounting base. Remove the covering from the fin and mounting base at the marks.

❏ 3. Mount the ventral fin base to the bottom rear of the fuselage with four #4 x 1/2" [12.7mm] screws and four #4 flat washers. Drill 1/16" [1.6mm] pilot holes for the screws. Enlarge the holes in the **mounting base only** with a 1/8" [3.2mm] drill bit. Harden the holes in the fuselage with some thin CA.
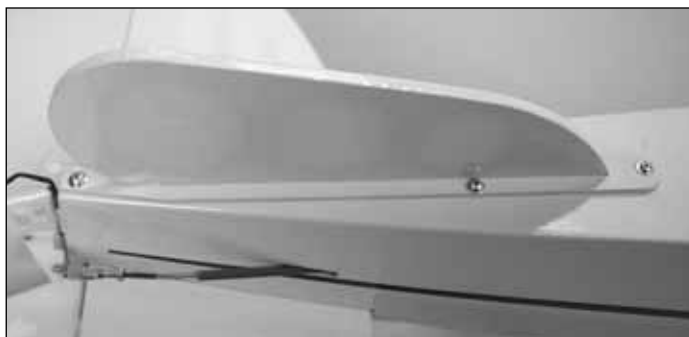
❏ 4. Tack glue the ventral fin to the mounting base with medium CA. Be very careful not to glue the mounting base to the fuselage.

Note: Make sure the ventral fin is perpendicular to the bottom of the fuselage.

❏ 5. Remove the ventral fin assembly from the fuselage. Solidly glue the ventral fin to the mounting base.

Balance the Model

More than any other factor, the **C.G.** (balance point) can have the **greatest** effect on how a model flies, and may determine whether or not your first flight will be successful. If you value this model and wish to enjoy it for many flights, **DO NOT OVERLOOK THIS IMPORTANT PROCEDURE.** A model that is not properly balanced will be unstable and possibly unflyable.

Most models are less stable with floats installed. The airflow across the model is considerably different and the weight of the floats is well below the CG, causing a pendulum effect when the model is turned or rolled. In addition, the total weight of the model is considerably higher. For these reasons the model will not fly as you have become accustomed to in the past.

For the first few flights with the floats installed, we recommend that you balance the model for a somewhat more nose heavy condition. This will increase the stability of the model until you become accustomed to the changed handling characteristics of the model. Remember that the model is heavier and you must increase the takeoff and landing speeds accordingly.

❏ 1. Place a mark 1/4" forward of the mark you made before you installed the floats. This will give a balance point 1/4" more nose heavy.

❏ 2. With the model assembled and the fuel tank empty, balance the model at the new balance point. It is likely that you will need about two ounces of lead to accomplish this.

Note: The added lead required to balance the model can be added to the firewall or to the front of the floats. We recommend that you add it to the top front of the floats, though this is a bit unsightly. In the future when you remove the floats and install the normal landing gear (and vice versa), you won't need to be concerned with removing or adding weight – or forget to do so.

FLYING

Before setting the model in the water, be sure the water rudder on the float is extended. A **reliable**, slow idle is a must. First flight attempts with floats should be reserved for relatively calm days when the water is not very choppy.

Practice taxiing around in the water to learn the handling characteristics, and see if you have built in enough throw on the water rudder. Make adjustments if required. During taxiing, hold "up" elevator to keep the nose of the aircraft high and the propeller out of the water spray.

Always takeoff into the wind. Gently add throttle and gradually release some of the up elevator as the speed increases and the aircraft lifts "on the step" of the floats. Just like the model takes off on the ground, when it has enough speed it will lift into the air – don't force it off. If the surface of the water is very smooth, it may take a bit more elevator to break the aircraft free of the surface tension of the water.

Continue a gradual, conservative climb out until you are at an altitude where you are comfortable making the downwind turn. Remember, the aircraft is heavier and has more drag than you are used to. Many modelers snap roll into the water on takeoff because they do not gain enough speed to allow for the added weight and drag.

Learn the flight characteristics of the model with the added weight and drag of the floats. The aerobatic response of the model will be considerably different with the floats installed. While the model should be perfectly capable of loops, rolls, stall turns and inverted flight – these maneuvers will require a much different pilot technique to do well.

Landing approach is the same on water as it is on land. Touch down slowly to avoid bouncing the aircraft off the water and back into the air. There is nothing that compares to a slow, smooth touchdown on the water. "Crabbing" or "Slipping" is a great technique used to bleed off excess airspeed during an approach. This is done by applying a balance of rudder and opposite aileron to make the aircraft fly "sideways". The path of the aircraft is "down the runway" while the nose is pointing off to one side. Just before the floats contact the water, release the rudder and opposite aileron.

Although it is difficult to do, the model can contact the water at such an angle as to allow the tips of the floats to "catch" the tops of any waves, thus flipping the model immediately. Avoid letting the floats contact the water at anything but a level attitude; and slightly nose high if there is much wave action.

Be considerate of others at the lake and enjoy your Great Planes ARF Sport Floats.

Great Planes® Pro™ Adhesives

GPMR6002 Thin Pro CA 1 oz.
GPMR6008 Medium Pro CA+ 1 oz.
GPMR6045 Pro 6-Minute Epoxy 9 oz.

High-quality Pro Adhesives provide model building's best bonds...and a "Best If Used By" date on the label for visible proof of freshness! Thin-formula Pro CA offers instant bonds, curing in just 1-3 seconds – it's ideal for most assembly needs. Medium CA+ is an excellent gap filler that cures in 10-15 seconds for a little more positioning time. The uniquely precise cure time of Pro 6-Minute Epoxy allows you to continue building with the confidence that epoxied parts won't be accidentally bumped out of alignment.

Great Planes® Precision Z-Bend Pliers
(GPMR8025)

These pliers automatically locate the precise Z-bend point for maximum servo arm performance – and they're so easy to use, even inexperienced modelers can make perfect Z-bends in minutes. Just insert the pliers' alignment pin into the servo horn hole that your pushrod will be connected to, and lightly hold the music wire where the bend will be placed. Remove the pliers from the servo horn, squeeze the handles, and make the bend...exactly where you need it! Works with wire up to 1/16" in diameter.

Futaba® S3003 Standard Servo
(FUTM0031)

This standard servo with preinstalled, round servo horn is ideal for car, boat and other applications. It comes with "J" connector on a 5 in. lead and hardware, including four brass eyelets, four rubber grommets, four mounting screws, and large and small "X" horns. Speed: 0.23 sec/60 degrees (4.8V). Torque: 44.4 oz-in (4.8V). Weight: 1.31 oz [37.2g]. Dimensions: 1.59 x 0.78 x 1.42 in [40.4 x 19.8 x 36mm].

Great Planes® C.G. Machine™ Airplane Balancer
(GPMR2400)

Every flier needs this ingenious tool! For optimum performance – or to achieve specific flight characteristics – every plane must be balanced correctly. Yet checking the balance in the "traditional" way (by hand) has always been difficult and imprecise. The C.G. Machine makes balancing easy and exact: Its slanted wire balancing posts accept any plane up to 40 lb...built-in rulers position it exactly at the recommended center of gravity. There's no guesswork!