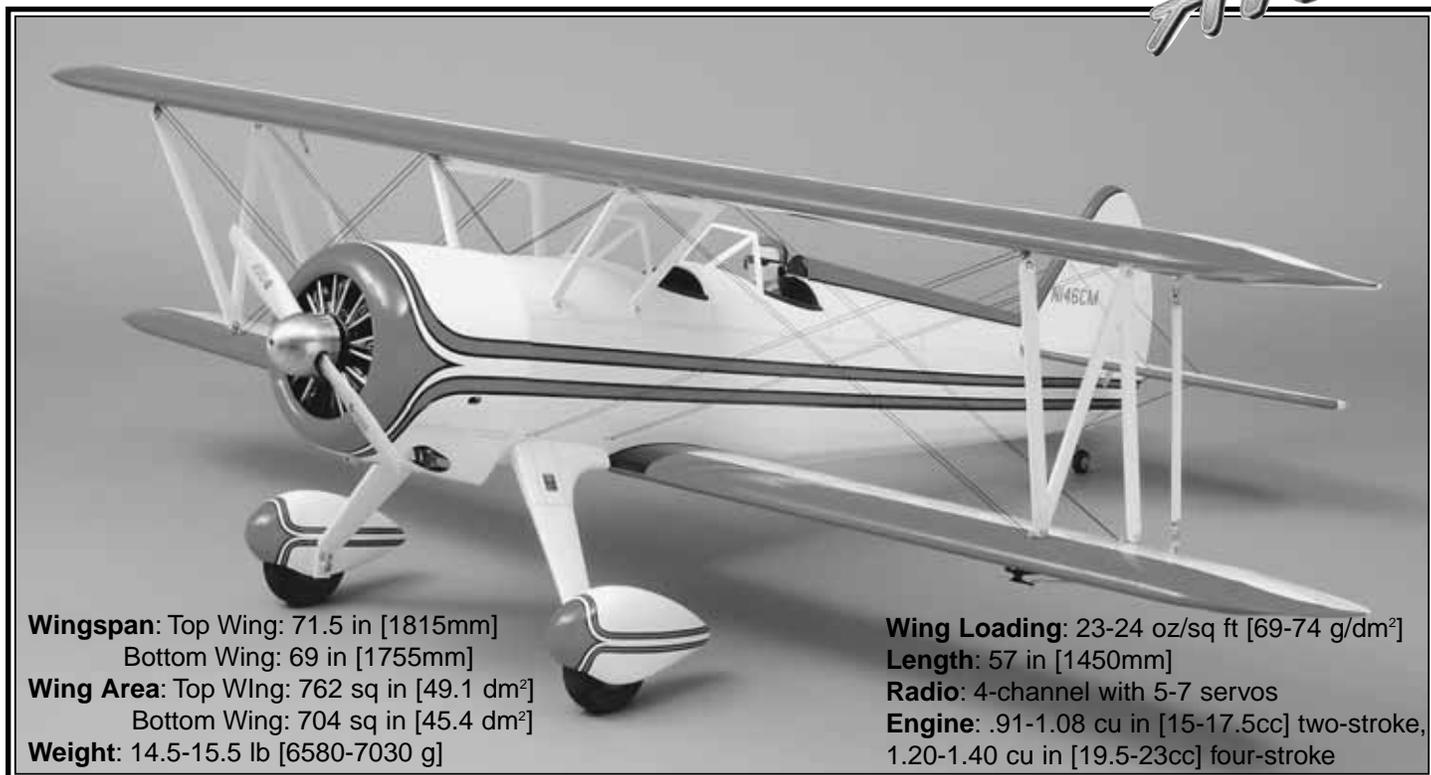


Super Stearman

INSTRUCTION MANUAL

ARF



Wingspan: Top Wing: 71.5 in [1815mm]
Bottom Wing: 69 in [1755mm]

Wing Area: Top WIng: 762 sq in [49.1 dm²]
Bottom Wing: 704 sq in [45.4 dm²]

Weight: 14.5-15.5 lb [6580-7030 g]

Wing Loading: 23-24 oz/sq ft [69-74 g/dm²]
Length: 57 in [1450mm]

Radio: 4-channel with 5-7 servos

Engine: .91-1.08 cu in [15-17.5cc] two-stroke,
1.20-1.40 cu in [19.5-23cc] four-stroke

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 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.

To make a warranty claim, send the defective part or item to Hobby Services at this address.

Hobby Services
3002 N. Apollo Dr. Suite 1
Champaign IL 61822
USA

Include a letter stating your name, return shipping address, as much contact information as possible (daytime telephone number, fax number, e-mail address), a detailed description of the problem and a photocopy of the purchase receipt. Upon receipt of the package the problem will be evaluated as quickly as possible.

READ THIS MANUAL BEFORE STARTING CONSTRUCTION. IT CONTAINS IMPORTANT INSTRUCTIONS AND WARNINGS CONCERNING THE ASSEMBLY AND USE OF THIS MODEL.



Champaign, Illinois

Telephone: (217) 398-8970 ext. 5

airsupport@greatplanes.com

GPMZ0295 for GPMA1350 V1

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INTRODUCTION

The Stearman has a long and colorful history in both military and civilian use. The Great Planes® Super Stearman ARF represents the best performing version of the civilian modifications made. You will thoroughly enjoy the wide range of capabilities of this plane as well as its good looks. We think you will be pleased with the attention to detail and its flight characteristics. For the latest technical updates or manual corrections to the Super Stearman visit the Great Planes web site at www.greatplanes.com. Open the "Airplanes" link, then select the Super Stearman ARF. If there is new technical information or changes to this model a "tech notice" box will appear in the upper left corner of the page.

IMAA

The Great Planes Super Stearman is an excellent sport-scale model and is eligible to fly in IMAA events. The IMAA (International Miniature Aircraft Association) is an organization that promotes non-competitive flying of giant-scale models. If you plan to attend an IMAA event, obtain a copy of the **IMAA Safety Code** by contacting the IMAA at the address or telephone number below, or by logging on to their web site at:

www.fly-ima.org/ima/sanction.html.

IMAA
205 S. Hilldale Road
Salina, KS 67401
(913) 823-5569

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

1. Your Super Stearman 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 Super Stearman, if not assembled and operated correctly, could possibly cause injury to yourself or spectators and damage to property.
2. You must assemble the model **according to the instructions**. Do not alter or modify the model, 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 take time to **build straight, true and strong**.
4. You must use an R/C radio system that is in first-class condition, and a correctly sized engine and components (fuel tank, wheels, etc.) throughout the building process.

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

6. 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.

7. 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.

8. While this kit has been flight tested to exceed normal use, if the plane will be used for extremely high stress flying, such as racing, the modeler is responsible for taking steps to reinforce the high stress points.

9. **WARNING:** The cowl, wheel pants and wing struts included in this kit are made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part (wheel pant, cowl) to remove fiberglass dust, as the dust will blow back into your eyes. Always wear safety goggles, a particle mask and rubber gloves when grinding, drilling and sanding fiberglass parts. Vacuum the parts and the work area thoroughly after working with fiberglass parts.

NOTE: We, as the kit manufacturer, provide you with a top quality kit and great instructions, but ultimately the quality of your finished model depends on how **you** build it; therefore, we cannot in any way guarantee the performance of your completed model, and no representations are expressed or implied as to the performance or safety of your completed 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. If you're not a member of a club, 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:

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>

ADDITIONAL ITEMS REQUIRED

Hardware and Accessories

This is the list of hardware and accessories required to finish the Super Stearman. Order numbers are provided in parentheses.

Engine (refer to the engine size requirements on the cover of the manual)

4-Channel radio

- (1) standard servo (throttle)
- (4) servos with minimum of 54 oz/in torque (2-ailerons, 1-elevator, 1-rudder)
- (2) 12" [300mm] servo extensions (for aileron servos, HCAM2711 for Futaba®)
- (1) Y-harness (for aileron servos, HCAM2751 for Futaba)
- (1) minimum 1,000mAh receiver battery

Propeller and spare propellers (refer to your engine manufacturer's recommendations)

2' [600mm] large, silicone fuel tubing (GPMQ4133)

Optional: If building the Super Stearman with four aileron servos, in addition to the items previously mentioned you will also need two more aileron servos, two more servo extensions and one more Y-harness.

Adhesives and Building Supplies

In addition to common household tools and hobby tools, this is the "short list" of the most important items required to build the Super Stearman. **Great Planes Pro™ CA and Epoxy glue are recommended.**

- R/C foam rubber (1/4" [6mm] - HCAQ1000, or 1/2" [13mm] - HCAQ1050)
- 1 oz. [30g] Thin Pro CA (GPMR6002)
- 1 oz. [30g] Medium Pro CA+ (GPMR6008)
- Pro 30-minute epoxy (GPMR6047)
- Pro 6-minute epoxy (GPMR6045)
- Drill bits: 1/16" [1.6mm], 5/64" [2mm], 3/32" [2.4mm], 1/8" [3.2mm], #29 or 9/64" [3.6mm], 3/16" [4.8mm],
- 3 pkgs Stick-on segmented lead weights (GPMQ4485)
- #1 Hobby knife (HCAR0105)
- #11 blades (5-pack, HCAR0211)
- Small T-pins (100, HCAR5100)
- R/C-56 canopy glue (JOZR5007)
- CA applicator tips (HCAR3780)
- Denatured Alcohol (for epoxy cleanup)
- Flat Black Fuelproof Paint (for cockpit)
- 8-32 Tap (GPMR8103)
- 8-32 Tap Handle (GPMR8120)

Optional Supplies and Tools

Here is a list of optional tools mentioned in the manual that will help you build the Super Stearman

- 2 oz. [57g] spray CA activator (GPMR6035)
- or -
- 4 oz. [113g] aerosol CA activator (GPMR634)
- Epoxy brushes (6, GPMR8060)
- Mixing sticks (50, GPMR8055)
- Mixing cups (GPMR8056)
- Builder's Triangle Set (HCAR0480)
- Curved-tip canopy scissors for trimming plastic parts (HCAR0667)
- Pliers with wire cutter (HCAR0630)
- Robart Super Stand II (ROBP1402)
- Hobbico® Duster™ can of compressed air (HCAR5500)
- Masking tape (TOPR8018)
- Microballoons (TOPR1090)
- Threadlocker thread locking cement (GPMR6060)
- Denatured alcohol (for epoxy clean up)
- Rotary tool such as Dremel™
- Rotary tool reinforced cut-off wheel (GPMR8200)
- Servo horn drill (HCAR0698)
- Dead Center™ Engine Mount Hole Locator (GPMR8130)
- AccuThrow™ Deflection Gauge (GPMR2405)
- CG Machine™ (GPMR2400)
- Precision Magnetic Prop Balancer™ (TOPQ5700)
- Fuel filler valve for glow fuel (GPMQ4160)

Important Building Notes

There are two types of screws used in this kit:

Sheet metal screws are designated by a number and a length.

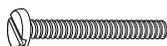
For example #6 x 3/4" [19mm]



This is a number six screw that is 3/4" [19mm] long.

Machine screws are designated by a number, **threads per inch**, and a length.

For example 4-40 x 3/4" [19mm]



This is a number four screw that is 3/4" [19mm] long with forty threads per inch.

- When you see the term **test fit** in the instructions, it means that you should first position the part on the assembly **without using any glue**, then slightly modify or *custom fit* the part as necessary for the best fit.

- Whenever the term **glue** is written you should rely upon your experience to decide what type of glue to use. When a specific type of adhesive works best for that step, the instructions will make a recommendation.

- Whenever just **epoxy** is specified you may use **either** 30-minute (or 45-minute) epoxy **or** 6-minute epoxy. When 30-minute epoxy is specified it is **highly** recommended that you use only 30-minute (or 45-minute) epoxy, because you will need the working time and/or the additional strength.

- **Photos** and **sketches** are placed **before** the step they refer to. Frequently you can study photos in following steps to get another view of the same parts.

- The Super Stearman is factory-covered with Top Flite MonoKote film. Should repairs ever be required, MonoKote can be patched with additional MonoKote purchased separately. MonoKote is packaged in six-foot rolls, but some hobby shops also sell it by the foot. If only a small piece of MonoKote is needed for a minor patch, perhaps a fellow modeler would give you some. MonoKote is applied with a model airplane covering iron, but in an emergency a regular iron could be used. A roll of MonoKote includes full instructions for application. Following are the colors used on this model and order numbers for six foot rolls.

White	TOPQ0204
Black	TOPQ0208
True Red	TOPQ0227

- The stabilizer and wing incidences and engine thrust angles have been factory-built into this model. However, some technically minded modelers may wish to check these measurements anyway. To view this information visit the web site at www.greatplanes.com and click on "Technical Data." Due to manufacturing tolerances which will have little or no effect on the way your model will fly, please expect slight deviations between your model and the published values.

Metric Conversions

1" = 25.4mm (conversion factor)

1/64" = .4mm	1" = 25.4mm
1/32" = .8mm	2" = 50.8mm
1/16" = 1.6mm	3" = 76.2mm
3/32" = 2.4mm	6" = 152.4mm
1/8" = 3.2mm	12" = 304.8mm
5/32" = 4mm	15" = 381mm
3/16" = 4.8mm	18" = 457.2mm
1/4" = 6.4mm	21" = 533.4mm
3/8" = 9.5mm	24" = 609.6mm
1/2" = 12.7mm	30" = 762mm
5/8" = 15.9mm	36" = 914.4mm
3/4" = 19mm	

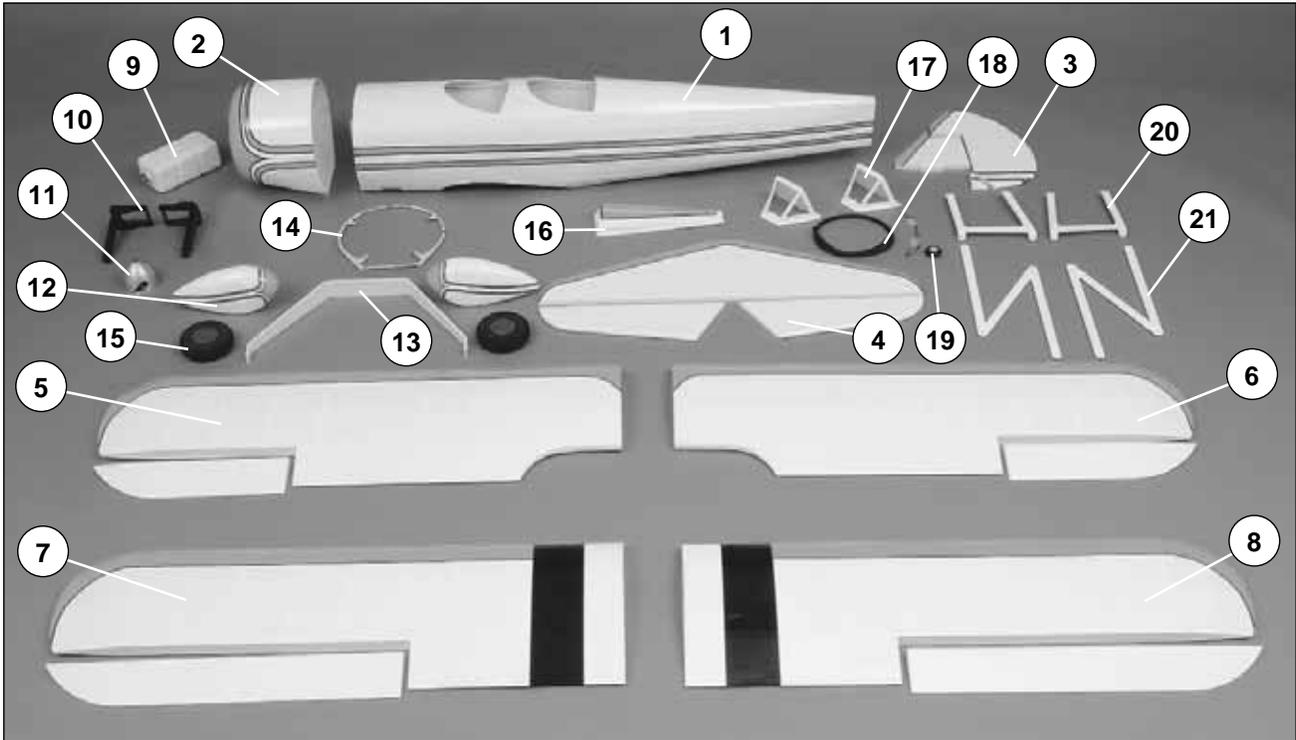
KIT INSPECTION

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 on this page.

Great Planes 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 Layout



PARTS PHOTOGRAPHED

1. Fuselage
2. Cowl
3. Fin & Rudder
4. Stab & Elevator
5. Top, Left Wing & Aileron
6. Top, Right Wing & Aileron
7. Bottom, Left Wing & Aileron
8. Bottom, Right Wing & Aileron
9. Fuel Tank
10. Engine Mount
11. Spinner
12. Wheel Pants
13. Landing Gear
14. Cowl Ring
15. Wheels
16. Turtle Deck
17. Windshields
18. Cockpit Coaming
19. Tail Wheel Assembly
20. Cabanes
21. Struts

PARTS NOT PHOTOGRAPHED

	Qty		Qty
4-40 Threaded Metal Clevis	. . . . . 4	8-32 x 3/4" SHCS	. . . . . 5
3/16 x 2" Axle	. . . . . 2	4-40 x 1/2" SHCS	. . . . . 16
BrassEZConnector	. . . . . 1	4-40 x 1/2" Phillips Head M/S	. . . . . 8
4-40 Blind Nuts	. . . . . 20	#2 x 3/8" WoodScrew	. . . . . 8
4-40 Nuts	. . . . . 4	8-32 x 1-1/4" SHCS	. . . . . 4
8-32 Blind Nuts	. . . . . 9	8-32 x 1" SHCS	. . . . . 4
5/16-24 Axle Nut	. . . . . 2	#2 x 1/2" SMS	. . . . . 4
1/4-20 Blind Nut	. . . . . 2	#4 x 1" MS	. . . . . 4
4-40 Nylon Lock Nuts	. . . . . 8	3/32" Wheel Collar	. . . . . 1
Large Nylon Control Horn	. . . . . 7	5/32" Wheel Collar	. . . . . 2
Small Nylon Control Horn	. . . . . 4	3/16" Wheel Collar	. . . . . 4
1/4-20 Nylon Bolt	. . . . . 2	1-1/4" Tail Wheel	. . . . . 1
Nylon Clevis	. . . . . 7	.074 x 17-1/2" Pushrod Wire	. . . . . 1
Nylon Retainer	. . . . . 1	.074 x 36" Pushrod Wire	. . . . . 3
2" x 9" Hinge material	. . . . . 1	.074 x 6" Pushrod Wire	. . . . . 4
Faslink	. . . . . 7	#4 Lock Washers	. . . . . 16
Clevis Retainer	. . . . . 11	#4 Flat Washer	. . . . . 24
#4 x 1/2" SMS	. . . . . 4	#2 Flat Washer	. . . . . 10
6-32 x 1/4" SHCS	. . . . . 6	#8 Lock Washers	. . . . . 8
4-40 x 1/8" Set Screw	. . . . . 1	#8 Flat Washer	. . . . . 8
4-40 x 1/4" SHCS	. . . . . 1	4-40 x 3/4" SHCS	. . . . . 4
#2 x 3/8" SMS	. . . . . 28		

Ordering Replacement Parts

Replacement parts for the Great Planes Super Stearman ARF are available using the order numbers in the Replacement Parts List that follows. The fastest, most economical service can be provided by your hobby dealer or mail-order company. Parts may also be ordered directly from Hobby Services, but full retail prices and shipping and handling charges will apply. Illinois and Nevada residents will also be charged sales tax.

To locate a hobby dealer, visit the Hobbico web site at www.hobbico.com. Choose "Where to Buy" at the bottom of the menu on the left side of the page. Follow the instructions provided on the page to locate a U.S., Canadian or International dealer. If a hobby shop is not available, replacement parts may also be ordered from Tower Hobbies at www.towerhobbies.com, or by calling toll free (800) 637-6050, or from Hobby Services by calling (217) 398-0007, or via facsimile at (217) 398-7721. If ordering via fax, include a Visa or MasterCard number and expiration date for payment.

Mail parts orders and payments by personal check to:

Hobby Services
3002 N Apollo Drive, Suite 1
Champaign IL 61822

Be certain to specify the order number exactly as listed in the Replacement Parts List. Payment by credit card or personal check only; no C.O.D.

If additional assistance is required for any reason, contact the appropriate Product Support by e-mail or by telephone at (217) 398-8970.

productsupport@greatplanes.com

REPLACEMENT PARTS LIST

Order Number	Description	How to purchase
GPMA2460	Bottom Wing Set	Hobby Supplier
GPMA2461	Top Wing Set	Hobby Supplier
GPMA2462	Fuselage Kit	Hobby Supplier
GPMA2463	Tail Surface Set	Hobby Supplier
GPMA2464	Landing Gear	Hobby Supplier
GPMA2465	Cowl Set	Hobby Supplier
GPMA2466	Wheel Pant Set	Hobby Supplier
GPMA2467	Cabane Set	Hobby Supplier
GPMA2468	Strut Set	Hobby Supplier
GPMA2469	Spinner	Hobby Supplier
GPMA2470	"Dummy" Radial Eng.	Hobby Supplier
GPMA2471	Decal Sheet	Hobby Supplier
GPMA2472	Windscreen Set	Hobby Supplier
GPMA2473	Metal Brackets	Hobby Supplier
GPMA2493	Instruction Manual	Hobby Supplier
	Missing pieces	Product Support
	Instruction manual	Product Support
	Full-size plans	Not available

Important Information about Working with Fiberglass

If you have never worked with fiberglass there are a few basic things you should be aware of.

1. When you are cutting into fiberglass, be sure you are cutting the correct place. Unlike wood, you are not able to go back and easily fix a mistake.
2. Whenever you are gluing a part to the inside of fiberglass it is important to roughen the inside surface of the fiberglass with 220-grit sandpaper, then wipe the area with alcohol. The molding process leaves a waxy residue that can prevent a good bond between the glue and the parts being glued.
3. If you do not have a high-speed motor tool such as a Dremel™ tool you should consider purchasing one or borrowing one from a fellow modeler. This combined with a fiberglass cut-off wheel is going to be extremely helpful in the assembly process.

WARNING: The cowl, wheel pants and fuselage included in this kit are made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into a part to remove fiberglass dust, as the dust will blow back into your eyes. Always wear safety goggles, a particle mask and rubber gloves when grinding, drilling and sanding fiberglass parts. Vacuum the parts and the work area thoroughly after working with fiberglass parts.

PREPARATIONS

1. If you have not done so already, remove the major parts of the kit from the box and inspect for damage. If any parts are damaged or missing, contact Product Support at the address or telephone number listed in the "Kit Inspection" section on page 5.

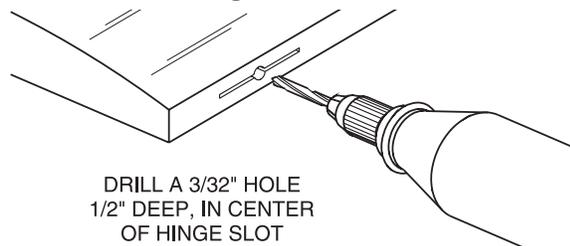


2. Carefully remove the tape and separate the ailerons from the wing and the elevators from the stab. If necessary, use a covering iron with a covering sock on high heat to tighten the covering. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.

BUILD THE WING

Install the Ailerons

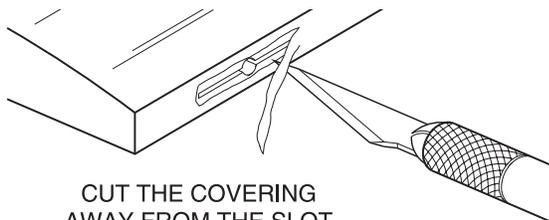
Do the right wing first so your work matches the photos the first time through. You can do one wing at a time, or work on them together.



DRILL A 3/32" HOLE
1/2" DEEP, IN CENTER
OF HINGE SLOT

- 1. Drill a 3/32" [2.4mm] hole, 1/2" [13mm] deep in the center of each hinge slot to allow the CA to "wick" in. Follow-up with a #11 blade to clean out the slots.

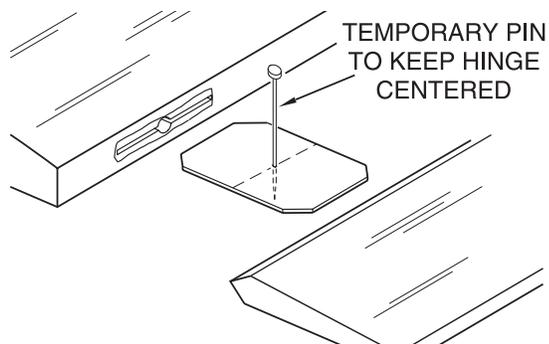
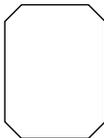
Hint: If you have one, use a high-speed rotary tool to drill the holes.



CUT THE COVERING
AWAY FROM THE SLOT

- 2. Use a sharp #11 blade to cut a strip of covering from the hinge slots in the wing and aileron.

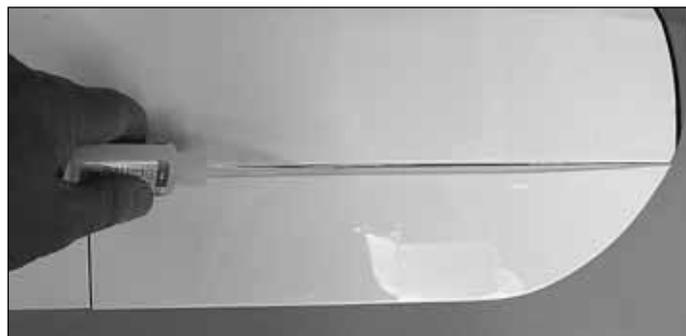
- 3. Cut fourteen 3/4" x 1" [19 x 25mm] hinges from the **CA hinge strip**. Snip off the corners so they go in easier.



TEMPORARY PIN
TO KEEP HINGE
CENTERED

- 4. Test fit the **ailerons** to the **wing** with the hinges. If the hinges don't remain centered, stick a pin through the middle of the hinge to hold it in position.

- 5. Remove any pins you may have inserted into the hinges. Adjust the aileron so there is a small gap between the LE of the aileron and the wing. The gap should be small, just enough to see light through or to slip a piece of paper through.



- 6. Apply six drops of thin CA to the top and bottom of each hinge. Do not use CA accelerator. After the CA has fully cured, test the hinges by pulling on the aileron.

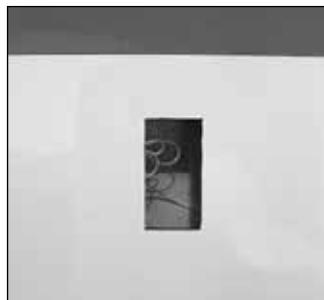
- 7. Repeat steps 1- 6 for the left wing panel.

- 8. Follow the same procedure for installing the ailerons on the top wing panels. Install the ailerons to the top wing panel with three hinges in each aileron.

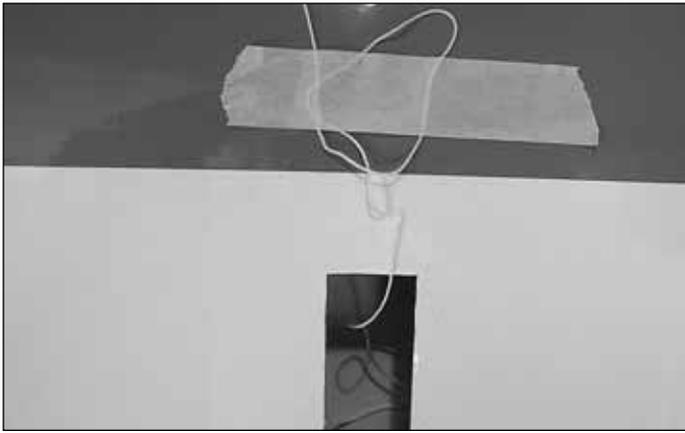
Join the Wing

Before installing the aileron servos you must make a decision on whether you will use two or four servos to drive the four ailerons. A separate servo bay is located in each wing panel for a four-servo installation. Should you choose to use the two-servo installation an aileron connecting rod goes between the top and bottom ailerons. The use of a connecting rod between the top and bottom wing is "scale" for a Stearman. If you choose to use the four servos you will not be able to use the aileron connecting rod due to the differential that is created between the top and bottom aileron. You will not have any noticeable performance difference with either option. If you do use two servos you will need to make sure they are at least 54 oz-in servos. Using four servos allows you to use less powerful servos (and most likely less expensive servos) but they will need to be at least 30 oz-in servos.

The following steps are required whether you install two or four servos.



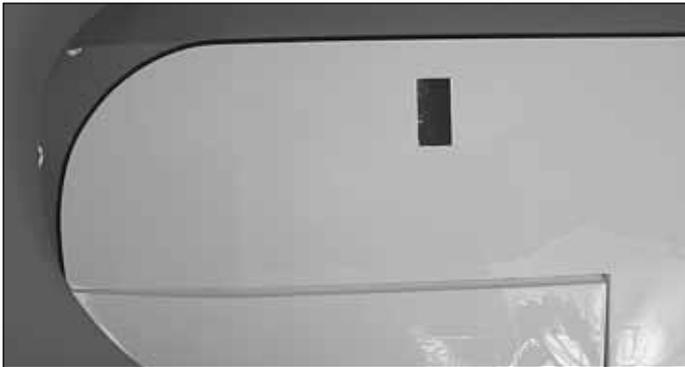
- 1. Cut away the covering from the servo bay in the bottom of the right bottom wing panel. Turn the wing over and cut the covering from the hole in the top of the wing at the wing root.



□ □ 2. A string is taped inside the servo bay. Carefully remove the string from the servo bay and tape it to the outside of the wing to prevent it from dropping back into the wing. The other end of the string is taped to the root rib. Remove the tape, thread the string through the small holes you cut the covering from on the bottom of the wing and tape the string to the wing.

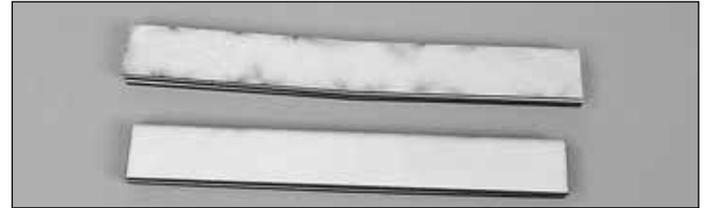
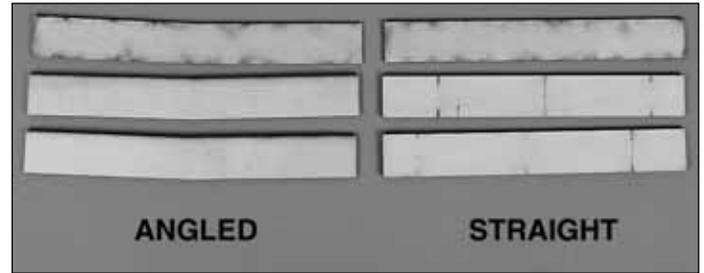
□ 3. Repeat steps 1 and 2 for the left bottom wing.

If you are installing servos in the top wing, proceed with steps 4 and 5. If not, skip ahead to step 6.



□ □ 4. Starting with the right wing panel for the top wing, cut away the covering from the servo opening on the bottom of the wing and the covering from the hole at the root of the wing. Remove the tape from the root rib, thread the string through the hole and tape the string to the wing. Tape the string in the servo bay to the wing, too.

□ 5. Repeat step 4 for the left wing.



□ 6. Locate three 1/8" [3mm] straight **plywood wing joiners** and three 1/8" [3mm] plywood wing joiners that are angled. Using 6-minute epoxy, glue the straight ones together to form one 3/8" [10mm] joiner and glue the three angled ones together forming the 3/8" [10mm] angled wing joiner.

□ 7. After the glue has cured, test fit the angled joiner into the bottom wing panels and the straight joiner into the top wing panels. Sand the joiners as needed to get a good fit.



□ 8. When you are satisfied with the fit of the joiners, glue the angled joiner into the bottom wing panels with 30-minute epoxy. Be sure that the top of the joiner is towards the top of the wing. When gluing the wing panels together be sure to get glue into the joiner pockets in the wing. This can be done by applying the glue into the pocket with a small stick. Apply glue to the pocket, the joiner and the root rib of the wing.



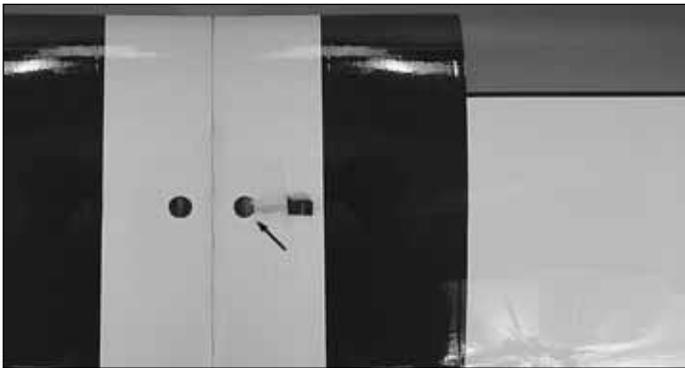
Before the glue cures, set one wing half flat on your bench. Insert the 1/2" x 1/2" x 3" [13 x 13 x 75mm] balsa block under the trailing edge of the wing that sits flat on the workbench. Block up the wing tip of the other wing half with the 2-1/16" x 2-1/16" x 2-1/16" [52 x 52 x 52mm] balsa block included in the kit. Put small weights on the wing half that is flat on the bench to keep it lying flat and leave the block under the wing tip of the other wing half while the glue cures.

❑ 9. Hold the wing together with masking tape while the glue is curing. Excess epoxy can be cleaned away with denatured alcohol and a paper towel.

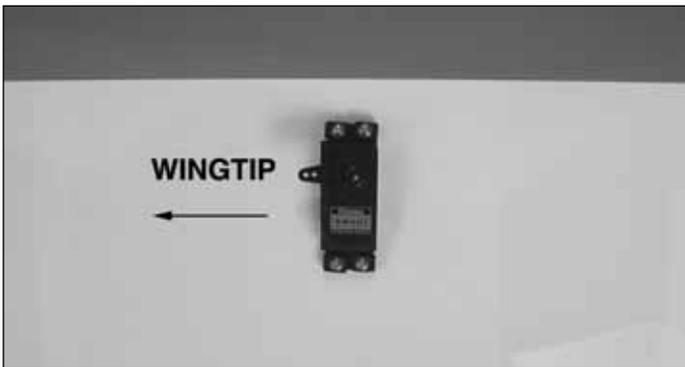
❑ 10. Glue the top wing together using the straight wing joiner and following the same gluing procedure used on the bottom wing. **Note:** There is no dihedral on the top wing. After gluing the wing together be sure it remains flat on the workbench while the glue cures.

Install the Aileron Servos & Pushrods

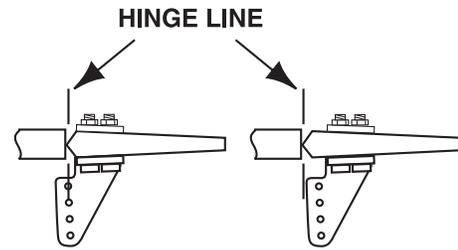
❑❑ 1. On the lower wing, install a 12" [305mm] servo extension onto the servo lead. Secure the extension to the lead with tape, a piece of shrink tube or some other method to keep them from coming unplugged.



❑❑ 2. Tie the string to the servo extension. At the root of the wing the other end of the string is taped. Pull the string and the servo lead through the wing. Untie the string from the lead and insert the lead through the small hole you cut the covering from. Tape the lead to the wing to prevent it from falling back into the wing.



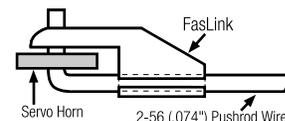
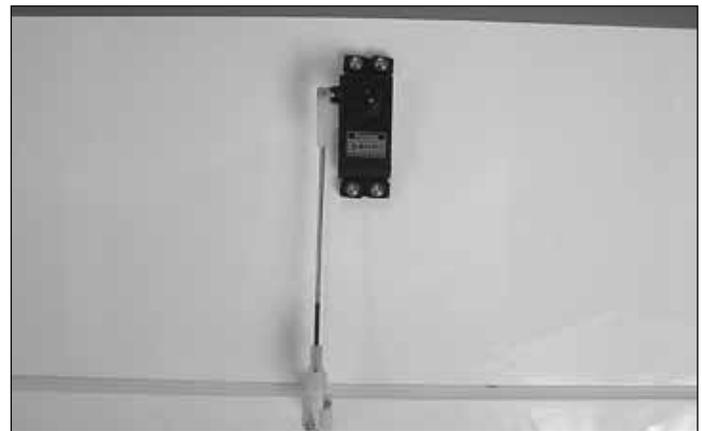
❑❑ 3. Install the servo into the servo opening. Drill through the servo mounting holes with a 1/16" [1.6mm] drill bit. Remove the servo from the servo opening. Install and then remove a servo mounting screw into each of the holes you have drilled. Apply a drop of thin CA into the holes to harden the threads. Once the glue has cured install the servo into the servo opening using the hardware included with your servo. Center the servo, then install a servo arm as shown. The arm should be pointing towards the wingtip.



CORRECT

INCORRECT

❑❑ 4. Place a nylon clevis in line with the last hole in the servo arm. When positioned properly the control horn will rest on a hardwood plate in the aileron. Mark the location of the mounting holes onto the aileron. Drill a 1/16" [1.6mm] hole on the marks, drilling through the plywood plate *but not* through the top of the aileron. Insert and remove a #2 x 3/8" [10mm] screw into each of the holes. Apply a couple drops of thin CA into the holes to harden the threads. Once the glue has cured attach the horn to the aileron with two #2 x 3/8" [10mm] screws.



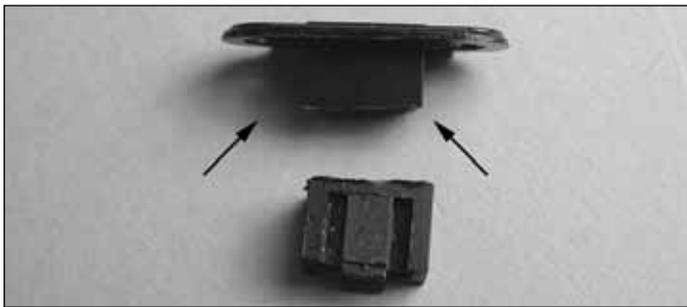
❑❑ 5. Thread a nylon clevis onto a .074 x 6" [152mm] threaded wire 20 turns. Slide a silicone clevis retainer onto the clevis. Install the clevis into the second hole from the end of the control horn, then slide the silicone retainer over

the clevis. Drill a 5/64" [2mm] hole in the outer hole of the servo arm. Center the servo and the aileron. With a fine-tip marker, mark the wire where it aligns with the outer hole of the servo arm. Make a 90 degree bend on the mark. Cut the wire so the wire is 3/8" [10mm] in length after the bend. Insert the wire into the servo arm and lock it in place with a nylon Faslink.

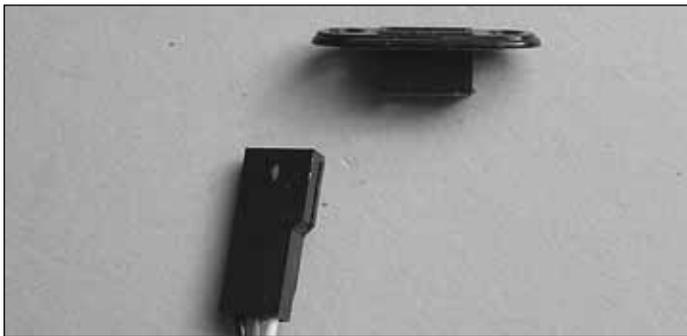
❑ 6. Repeat steps 1-5 for the left wing panel.

If you are installing servos in the top wing, repeat steps 1-6 for the top wing. If not, skip ahead to Step 12. *Steps 7- 11 are only if you are installing servos in the top wing.*

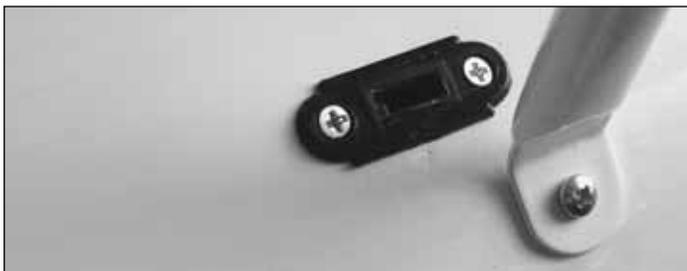
❑ 7. A "Y" harness is required to connect the servos in the upper wing to the receiver. Plug the two servo leads in the top wing into a "Y" harness compatible with your radio system. To provide a plug into the receiver we have used a slightly modified Ernst Charge Receptacle (ERN3124 for Futaba) and a 12" [305mm] servo extension.



❑ 8. Cut the charge receptacle in half just above the locking fingers.



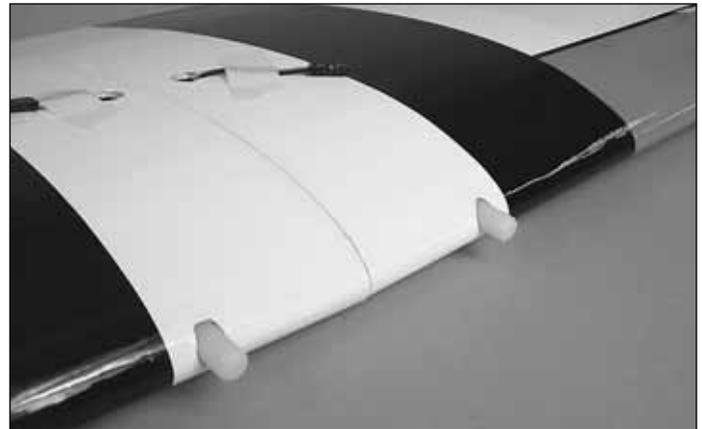
❑ 9. Put a couple of small drops of medium CA on the sides of the female end of the servo extension. Then slide the servo extension into the charge receptacle.



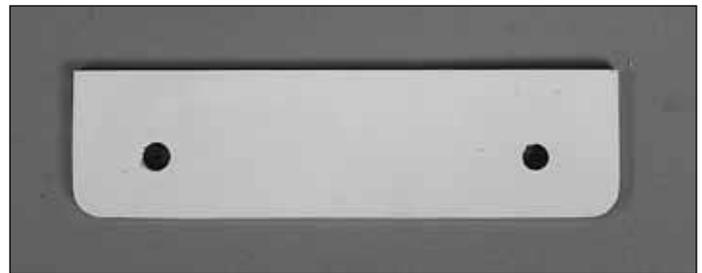
❑ 10. Near one of the cabanes, cut a hole in the top of the fuselage just large enough for the servo extension and the

charge receptacle to fit into. Drill a 1/16" [16mm] hole into the fuselage through each of the mounting holes in the charge receptacle. Thread and remove the screws from the charge receptacle into the holes you drilled. Apply thin CA into the holes to harden the threads. Glue the charge receptacle to the fuselage with R/C 56 canopy glue. Install the mounting screws in the charge receptacle, into the holes you have drilled.

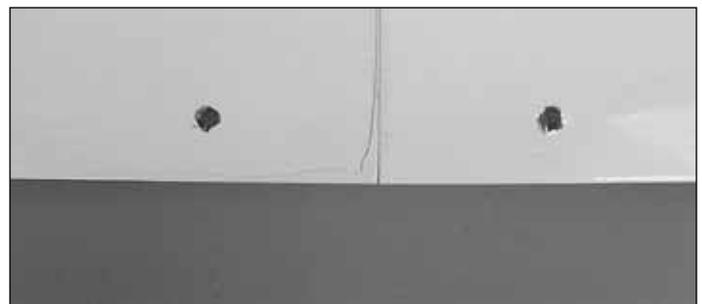
Later, when you are installing the radio system, this servo extension will be plugged into the proper channel of your receiver. When preparing the airplane to fly you will be able to plug the upper wing servos into the receptacle, completing the connection from the upper wing to the receiver.



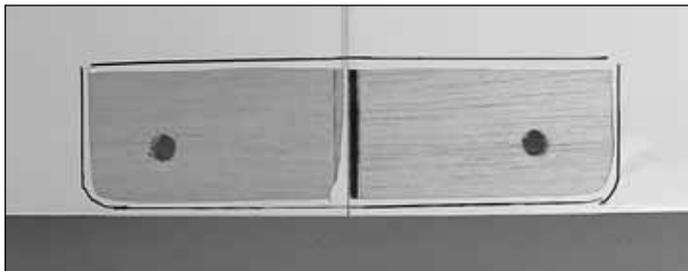
❑ 11. On the bottom wing, cut the covering away from the holes in the leading edge of the wing for the nylon **wing dowels**. Glue them in place with 6-minute epoxy. Wipe any excess epoxy away with denatured alcohol. When properly positioned the wing dowels should extend approximately 3/8" [10mm] beyond the leading edge of the wing.



❑ 12. Cut the covering from the holes on the plywood **wing bolt plate**.



❑ 13. Cut the covering from the holes at the wing trailing edge on both the top and bottom of the wing.

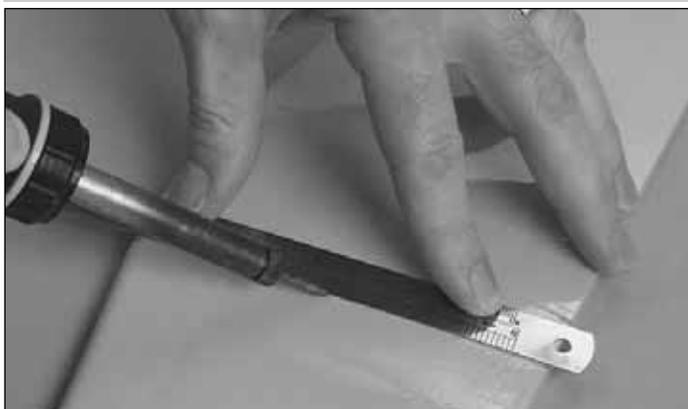


❑ 14. Place the wing bolt plate in position over the holes in the bottom wing. Use the nylon wing bolts to help you align the holes in the plate with the holes in the wing. Trace the outline of the plate onto the covering with a felt-tip pen. Use a sharp #11 blade or the expert tip that follows to cut the covering inside the lines you have drawn. Use caution not to cut through the surface of the wing skin. Remove the covering.



EXPERT TIP
EXPERT TIP

HOW TO CUT COVERING FROM Balsa.



Use a soldering iron to cut the covering. The tip of the soldering iron doesn't have to be sharp, but a fine tip does work best. Allow the iron to heat fully. Use a straightedge to guide the soldering iron at a rate that will just melt the covering and not burn into the wood. The hotter the soldering iron, the faster it must travel to melt a fine cut. Peel off the covering.



❑ 15. Glue the wing bolt plate to the wing using epoxy. Use small clamps to hold the wing bolt plate in position while the glue cures.

BUILD THE FUSELAGE

Preparations



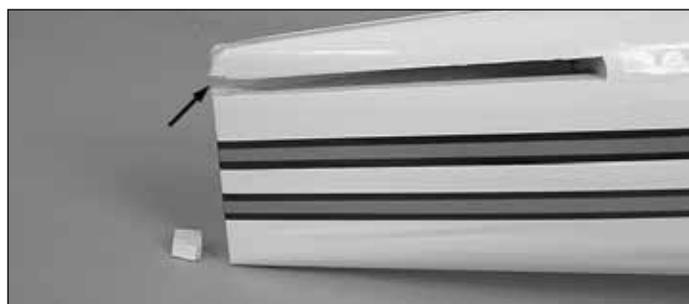
❑ 1. Remove the belly pan from the bottom of the fuselage. Install the landing gear to the fuselage with five 8-32 x 3/4" [19mm] socket head cap screws. Apply a drop of thread locker to each bolt before installing them.

❑ 2. Glue the belly pan back in place with a few dabs of silicone glue. Using silicone will allow you to remove the belly pan easily should you ever have to get access to the landing gear bolts.

We will come back and do the installation of the wheels and wheel pants later. Having the landing gear installed at this time will make it easier to handle the fuselage on the workbench.

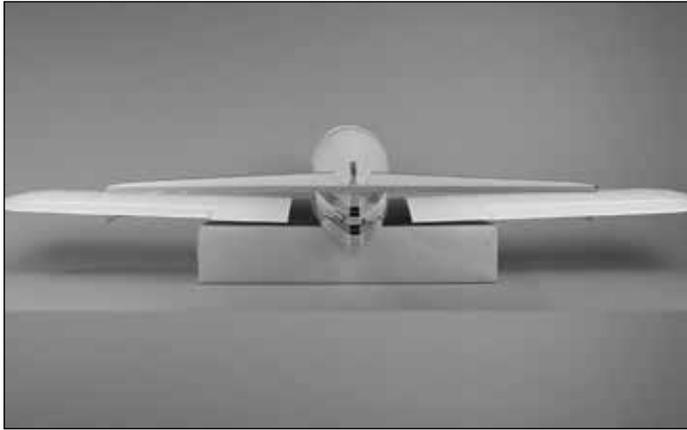


❑ 3. Cut the covering from the fuselage where the horizontal stabilizer fits into the fuselage.

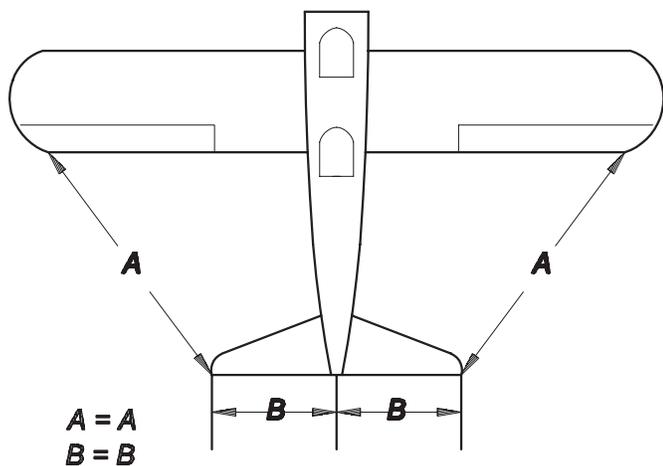


❑ 4. Cut the covering and the wood block from the back of the horizontal stabilizer saddle.

Install the Stab, Elevator, Fin & Rudder



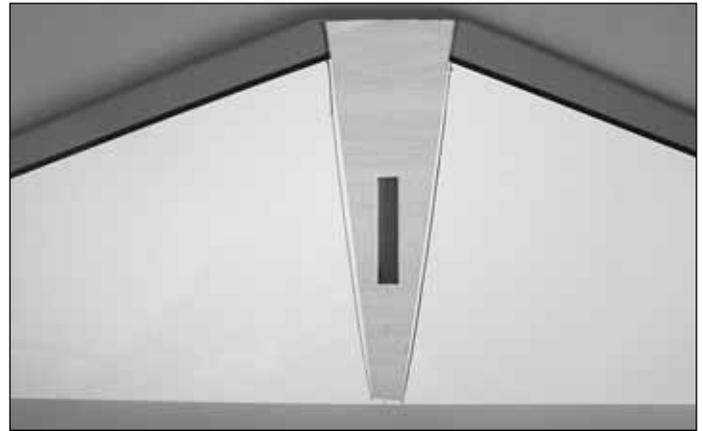
□ 1. Temporarily attach the lower wing to the fuselage with the 1/4-20 nylon bolts. Slide the **horizontal stabilizer** into the slot in the fuselage. Stand back and look at the stab in relation to the wing. The stab should be parallel with the wing. If not, sand the stab saddle until the stab and wing are aligned.



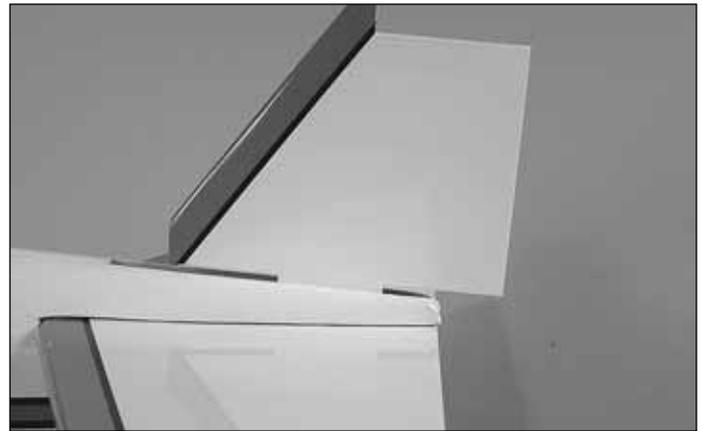
□ 2. Measure the distance from the tip of the stab to the tip of each wing. Adjust the position of the stab until they are equal.



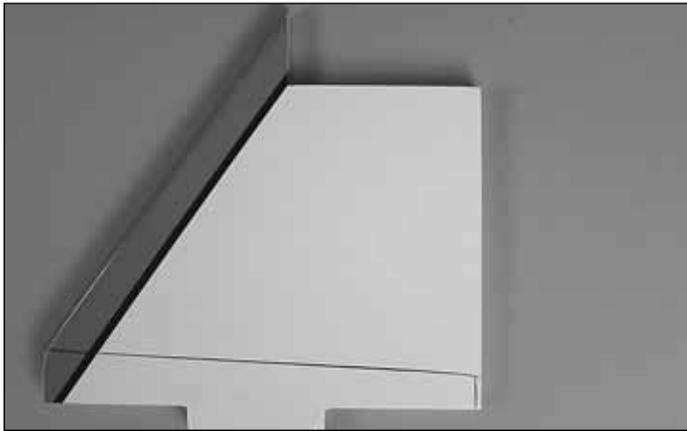
□ 3. Using a felt-tip pen, mark the outline of the fuselage on the top and the bottom of the stab.



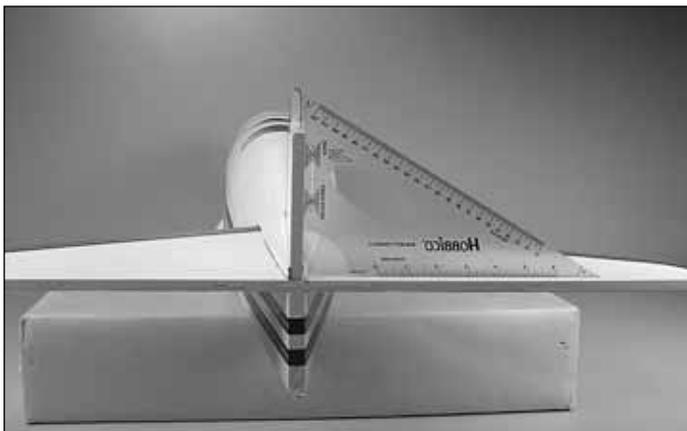
□ 4. Cut the covering on the top and bottom of the stab inside the line you have drawn. Use the same technique for removing the covering from the wing.



□ 5. Glue the stab in place with 30-minute epoxy. Excess epoxy can be cleaned away with a paper towel and denatured alcohol. After the stab is positioned and all excess epoxy has been cleaned away, temporarily install the **vertical fin** part of the way into the slot. Just put it into place enough to verify that you have not pushed the wood fuselage fairings too close together and that the slot in the stab is aligned with the opening for the fin. Remove the fin and allow the glue to cure. If any glue has gotten on the fin, remove it with denatured alcohol.



- ❑ 6. Remove the bottom wing from the fuselage. Temporarily install the fin into the slot in the top of the fuselage. Using a fine-point felt-tip pen, mark the outline of the fuselage onto the fin. Cut the covering from the fin using the same method used earlier.

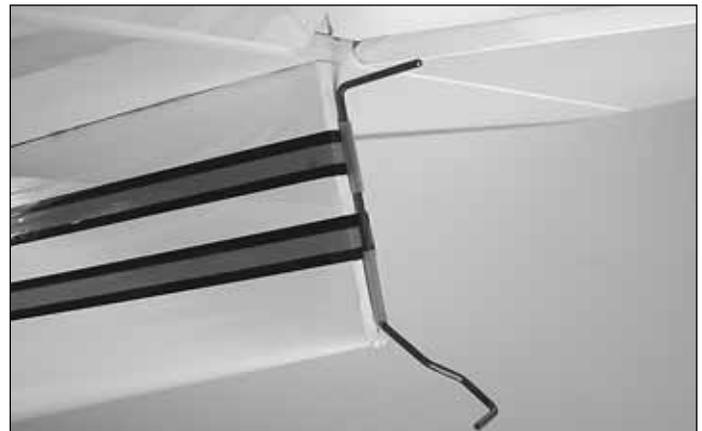
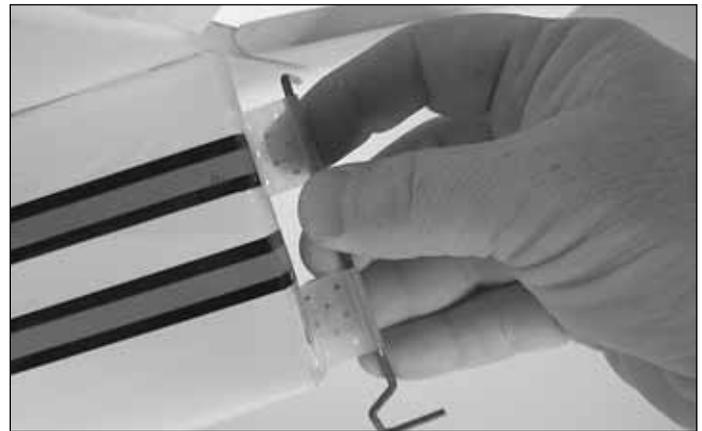


- ❑ 7. Test fit the fin into the fuselage. Check to be sure the fin is perpendicular to the stab. If it is not, sand the side of the fin to make minor adjustments. Once you are satisfied with the fit, glue the fin to the fuselage with epoxy.

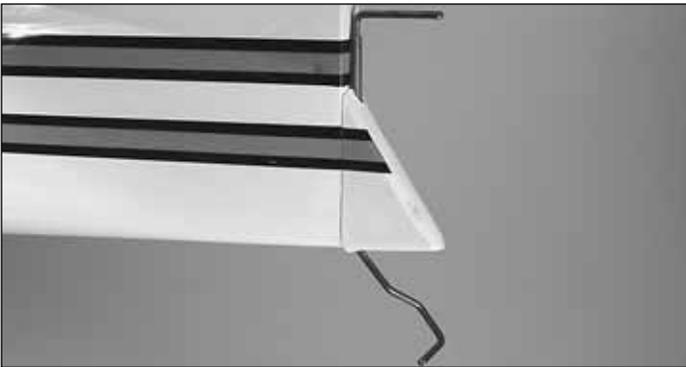
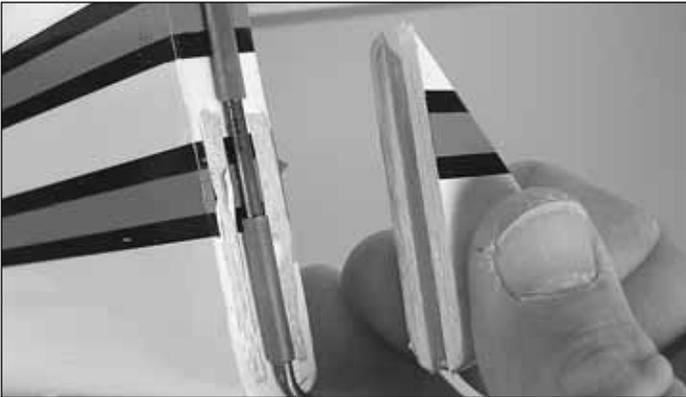
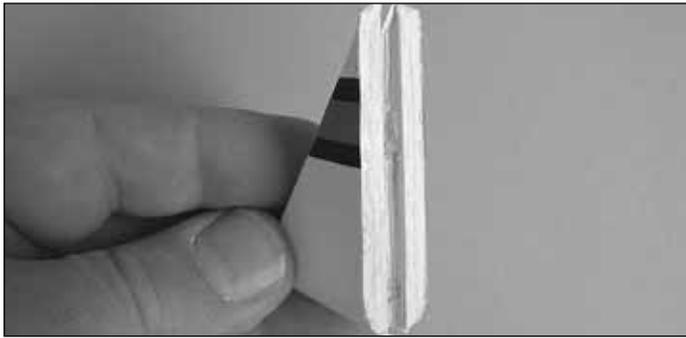
- ❑ 8. Using the same installation method used previously, install three hinges into each elevator half. Then install the elevators into the stab. Glue the hinges using thin CA.

Did you know?...Built as a private venture by the Stearman Aircraft Company of Wichita (bought by Boeing in 1934), this two-seat biplane was of mixed construction. The wings were of wood with fabric covering while the fuselage had a tough, welded steel framework, also fabric covered. In 1936, the Army tentatively bought 26 airframes from Boeing (the Model 75), which the Army named the PT-13. With war on the horizon, this trickle of acquisition soon turned into a torrent; 3519 were delivered in 1940 alone.

Did you know?...The Stearman gained a reputation as a rugged airplane and a good teacher. Officially named the Boeing Model 75, the plane was (and still is) persistently known as the "Stearman" by many who flew them. It was called the "PT" by the Army, "N2S" by the Navy and "Kaydet" by Canadian forces. By whatever name, more than 10,000 were built by the end of 1945 and at least 1,000 are still flying today worldwide.



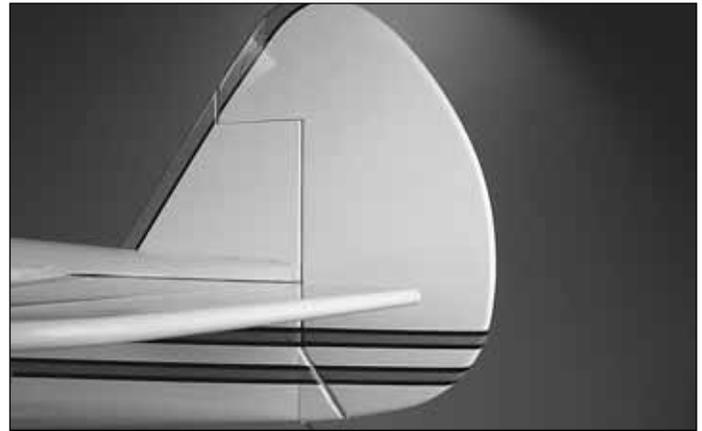
- ❑ 9. Locate the **tail wheel wire**. Test fit it into the two slots in the back of the fuselage. Use your hobby knife to clean out the slots if it is too tight. Once satisfied with the fit, remove the wire from the slots. Apply a couple of drops of oil to the wire where it passes through the nylon bearings. This will prevent glue from getting onto the wire. Apply epoxy to the nylon tabs and then install the tail wheel wire into the fuselage.



❑ 10. Cut the covering from the front of the balsa **triangle tail block**. Cut the covering from the back of the fuselage where the block will be glued to the fuselage. Test fit the block over the landing gear wire. Make adjustments to the slot in the block as needed. Glue the block to the fuselage. Be careful not to get glue on the wire.



❑ 11. Cut the covering from the hole on the leading edge, bottom of the rudder. Test fit the hinges into the rudder and then fit the rudder to the fin and fuselage. Make any adjustments that may be needed to the slot in the rudder. When you are satisfied everything fits well, put a small amount of epoxy into the hole in the rudder, install the hinges in the rudder and install the rudder to the fin.

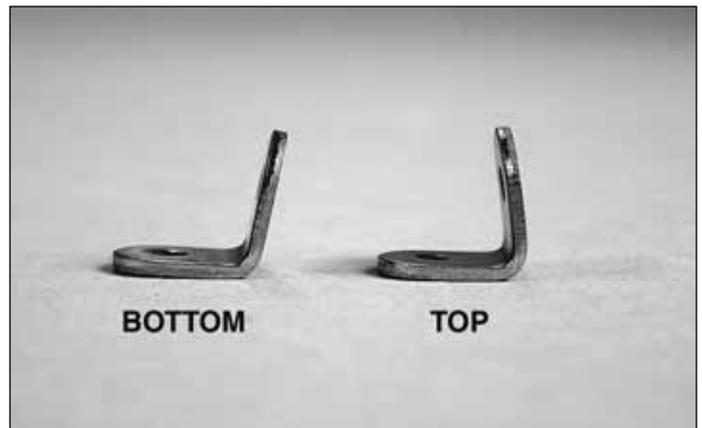


❑ 12. Glue the hinges to the fin and rudder with thin CA.

Did you know?...After World War II, many Stearmans were fitted with Pratt & Whitney 450 h.p. engines and utilized as crop dusters. These more powerful Stearmans are also commonly known as the "Super Stearman" and used for wing-walking or aerobatic routines at air shows.

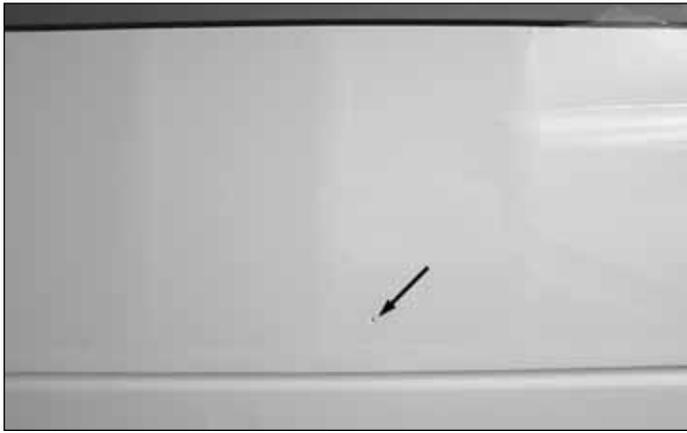
Attach the Wing and Cabanes

❑ 1. Attach the lower wing to the fuselage with the 1/4-20 nylon bolts.

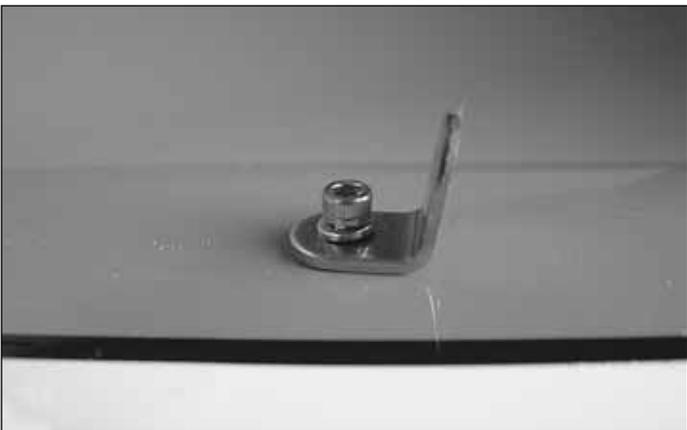


❑ ❑ 2. Locate eight metal **cabane mounting brackets**. The photograph identifies the correct bracket for the top and bottom wing. Set the four brackets for the top wing to the side. We will be installing the brackets on the bottom wing first.

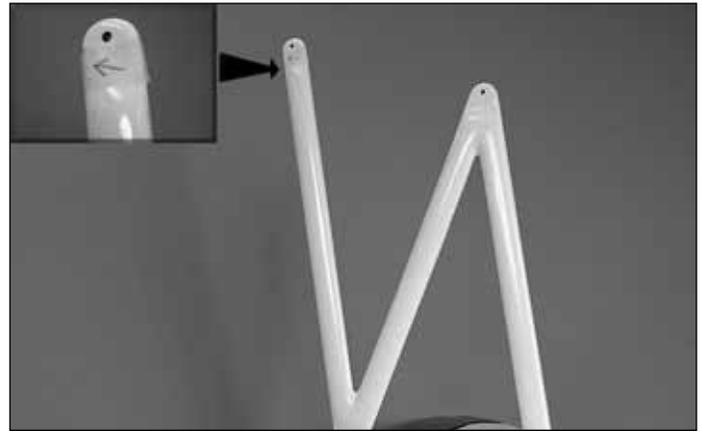
Do the right wing first so your work matches the photos the first time through.



□ □ 3. Look closely on the top of the bottom wing and you will find a small pin hole locating the blind nuts for the cabane mounting bolts. Cut the covering from each of the holes. **Note:** 4-40 blind nuts have been installed in the wing for all of the cabane mounting bolts. All of the blind nuts are glued into the wing and have a small wood plate backing them up. It is possible that a blind nut could have a bit of glue in the threads. In most cases the installation of the bolt should free the glue. If not, run a 4-40 tap through the threads to clear the glue.



□ □ 4. Mount the bottom wing cabane brackets in each of the holes in the right wing panel with a 4-40 x 1/2" [13mm] socket head cap screw and a #4 lock washer. Do not fully tighten the bracket to the wing yet.

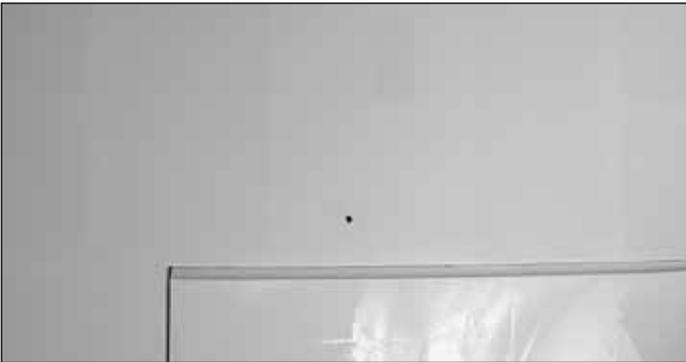


□ □ 5. Position the "N" strut to the bracket. Located on the strut is a piece of masking tape with an arrow that indicates the top, front of the strut.



□ □ 6. Attach the strut to the bracket as shown with a 4-40 x 1/2" [13mm] phillips head screw, a #4 washer and a 4-40 nylon lock nut.

□ □ 7. If you have not been doing the bracket installation on both the right and left wing, go back and repeat steps 3-6 for the left wing panel.



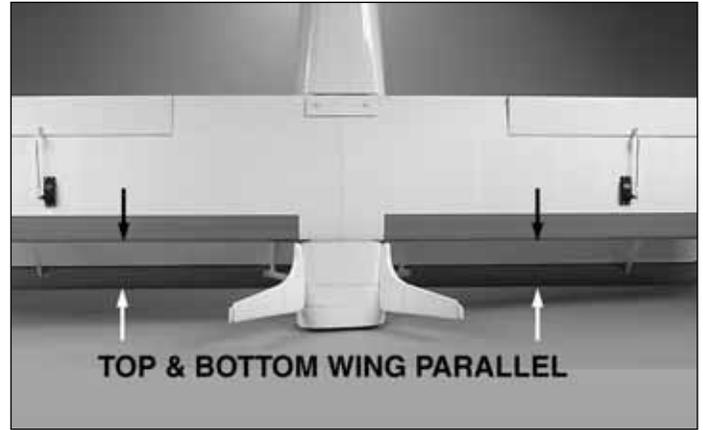
❑ 8. Locate the pin holes and cut the covering from the blind nuts in the bottom of the top wing. Four are located in the center of the wing and two are located at each end of the wing.



❑ 9. Install the center cabanes with 4-40 x 1/2" [13mm] socket head cap screws and #4 lock washers. Be sure you mount the cabanes as shown.

❑ 10. Install the four remaining brackets in the blind nuts at the ends of the wing.

❑ 11. Place the top wing onto the "N" struts. Attach the top wing to the "N" struts with 4-40 x 1/2" [13mm] phillips head screws, #4 washers and 4-40 nylon lock nuts the same way you installed the strut to the lower brackets.



❑ 12. Set the fuselage on the firewall. Look at the relation of the top wing to the bottom wing. Be sure the top wing is parallel with bottom wing. Adjust the top wing as needed. Then carefully set the fuselage back on the landing gear.

❑ 13. Without disturbing the top wing, push a T-pin into the fuselage through each of the cabane mounting holes. Push the pin hard to verify that the mounting holes are positioned over the hardwood rails. If you do not find hardwood and only hit balsa wood, check to see if you have mounted the center cabanes properly. If you have the center cabanes backwards they will not align over the hardwood rails.

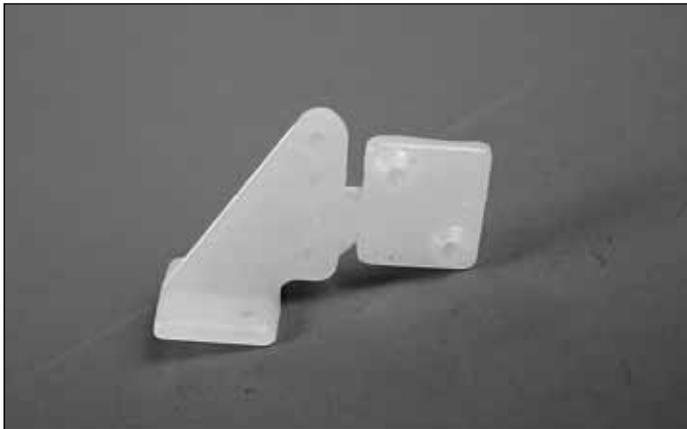
❑ 14. Drill a 5/64" [2mm] hole through each of the four mounting holes in the center cabanes. When you drill these holes you **must** be drilling into the hardwood rails located in the fuselage.



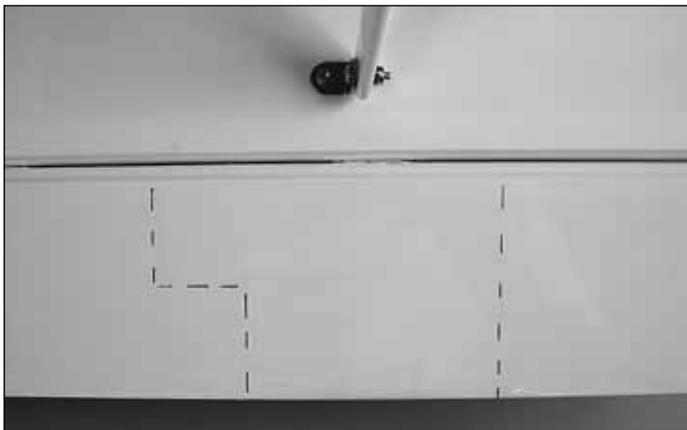
❑ 15. Install and then remove a #4 x 1/2" sheet metal screw into each of the four holes. Apply a couple drops of thin CA into each of the holes to harden the threads. After the glue has cured permanently install the screws into the fuselage.

Install the Aileron Connecting Rod

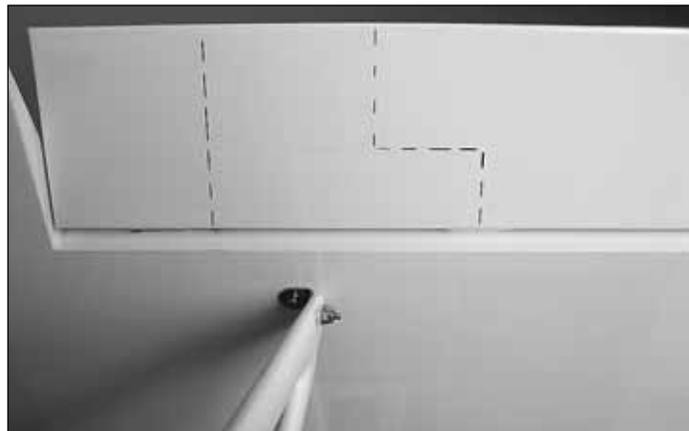
If you have decided to install four servos in the wings instead of two, skip the 12 steps in this section and proceed to, "Build the Carry Handle".



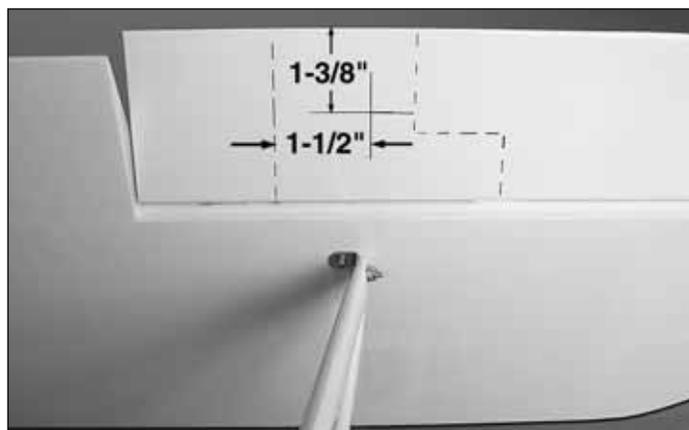
1. Locate two small nylon control horns. Cut them as shown.



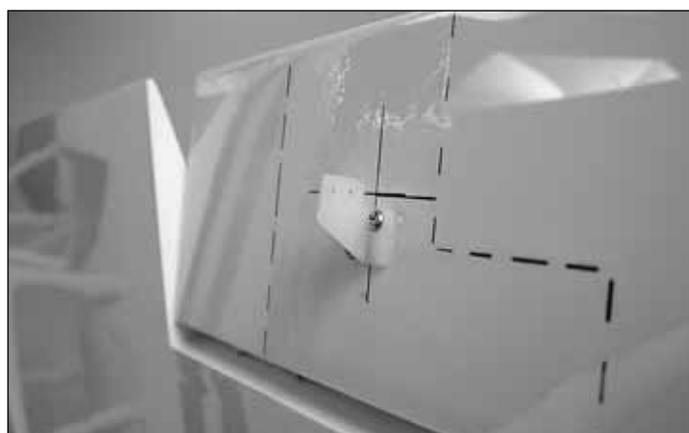
2. On the bottom wing, on top of the aileron is a large plywood plate. Outline this plate with a felt-tip marker (this can be wiped away later with denatured alcohol) or outline it with masking tape.



3. On the top wing, on the bottom of the aileron is a large plywood plate. Outline this plate with a felt-tip marker (this can be wiped away later with denatured alcohol) or outline it with masking tape.



4. Measure from the inside edge of the plate out 1-1/2" [38mm] and draw a line. Measure from the trailing edge of the aileron in 1-3/8" [35mm] and draw another line.



5. Position one of the cut control horns so the holes in the control horn are positioned over the intersection of the two lines you have drawn. Note that the holes face the trailing edge of the aileron. Mark the hole locations and drill a 1/16" [1.6mm] hole through each of the marks. Be sure to drill only through the plywood plate. Insert and remove a #2 x 3/8" [10mm] sheet metal screw into each of the holes. Apply a couple of drops of thin CA into the holes to harden the threads. After the glue cures, mount the control horn with the screws.



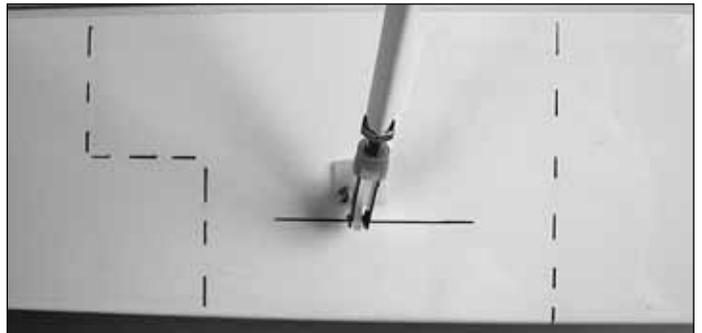
□ □ 6. Locate the **aileron connecting rod**. Cut the excess rubber coating to expose all of the threads.



□ □ 7. Install a 4-40 nut, 4-40 metal clevis and a silicone clevis keeper on both ends of the connecting rod.



□ □ 8. Install one end of the connecting rod to the outer hole of the control horn on the aileron of the top wing.



□ □ 9. Attach the remaining control horn to the other end of the connecting rod. Adjust the clevises so that the length of the connecting rod allows the top aileron and bottom ailerons to be neutral.

Place the control horn on the aileron of the bottom wing, position it as needed until the connecting rod is aligned with the back of the "N" strut and parallel to the "N" strut as viewed from the side. Once properly positioned, mark the location of the clevis holes. This will make the center of the clevis holes approximately 1" [25mm] from the trailing edge of the aileron.

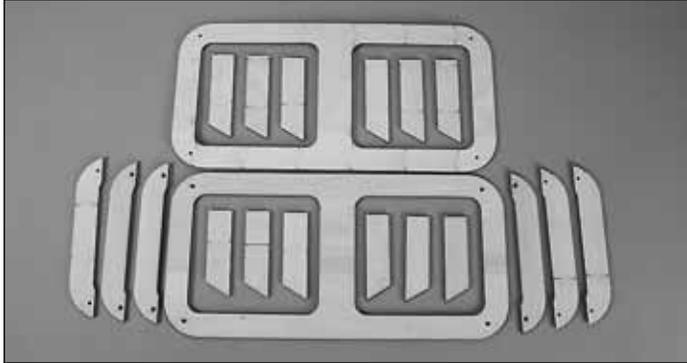
□ □ 10. Drill a 1/16" [1.6mm] hole through each of the marks. Be sure to drill only through the plywood plate. Insert and remove a #2 x 3/8" [10mm] sheet metal screw into each of the holes. Apply a couple of drops of thin CA into the holes to harden the threads. After the glue cures mount the control horn with the screws.

□ □ 11. Make any additional adjustments to the clevises on the ends of the connecting rod as needed until both the top and bottom aileron are neutral. Tighten the 4-40 nuts against the clevises on the connecting rod to prevent the connecting rod from rotating.

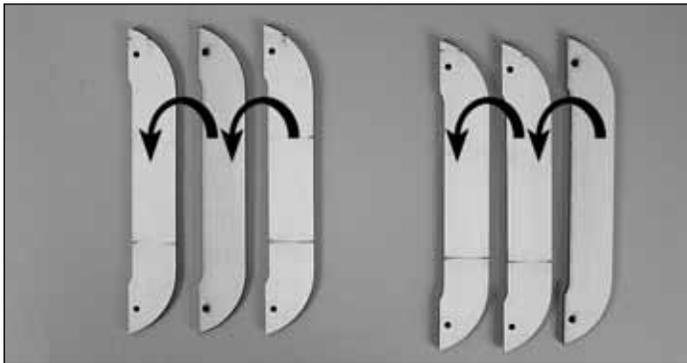
□ □ 12. Repeat steps 1-11 for the left wing.

Build the Carry Handle

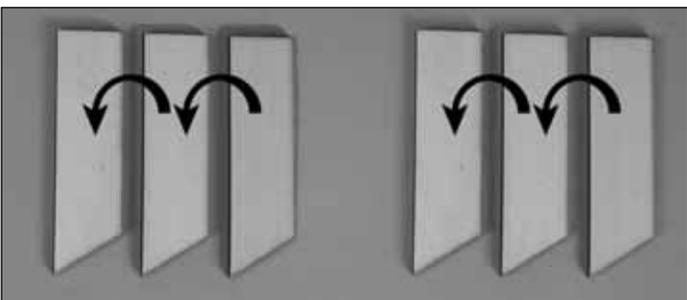
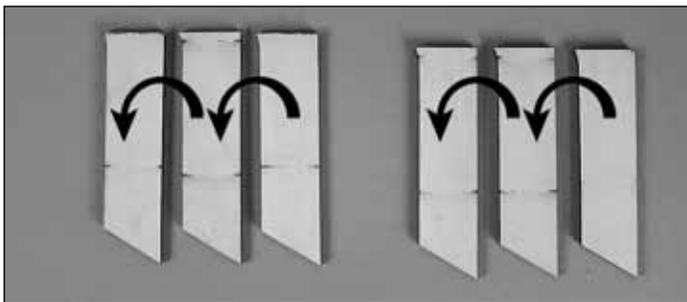
This kit comes with a convenient carrying handle for the fuselage and the struts. It is also useful during the remainder of the construction process because, when installed, it will allow you to turn the plane upside-down on the workbench without flexing or bending the center cabanes.



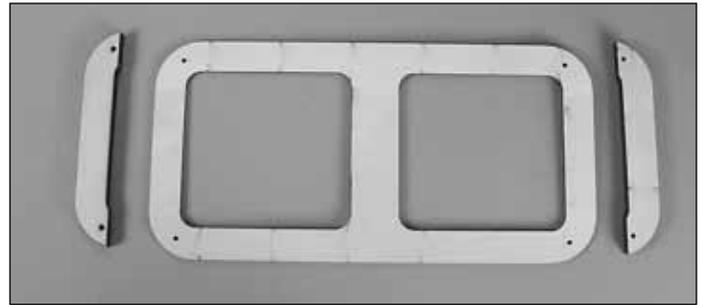
❑ 1. Locate all of the 1/8" [3mm] plywood parts of the **handle**.



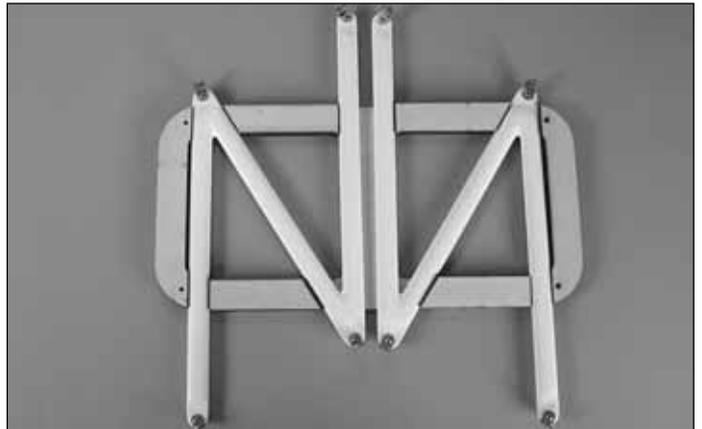
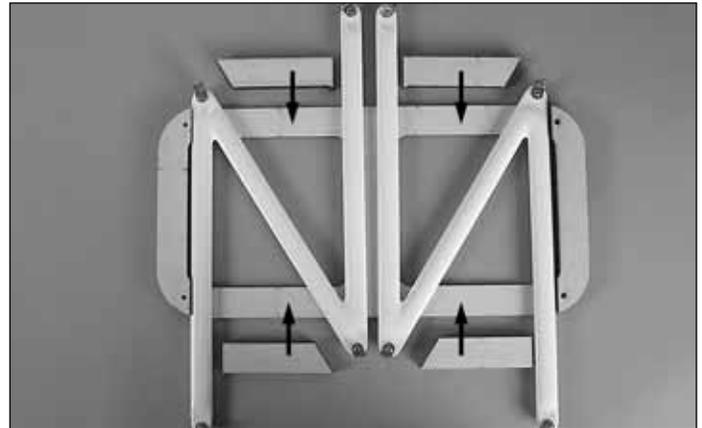
❑ 2. Glue the three parts of each set together as shown to make a pair 3/8" [9mm] thick.



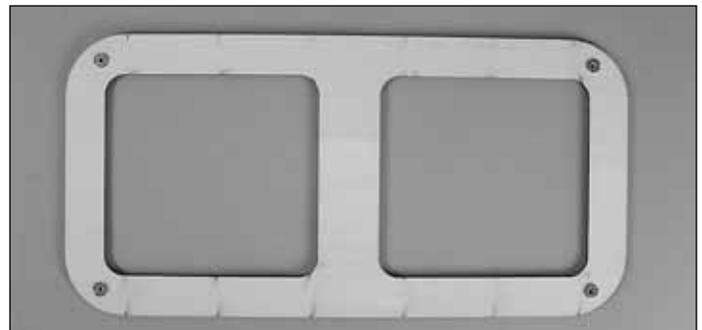
❑ 3. Do the same with the remaining six parts, making two pairs of each.



❑ 4. Glue the two parts shown onto one of the plywood handle parts.



❑ 5. Place the "N" struts onto the handle leaving space between the struts in the center of the handle as shown. The remaining parts you glued together should fit between the "N" struts. Once you are sure the struts and the remaining pieces fit properly, glue the plywood parts to the handle.



❑ 6. On the remaining handle part, install a 4-40 blind nut into each of the corner holes.



□ 7. Place the two “N” struts into the handle and the two aileron connecting rods between the struts. Put the handle top onto the part of the handle holding the struts and place the completed handle on top of the cabanes. Secure the handle to the cabanes with four 4-40 x 3/4" [19mm] socket head cap screws and #4 flat washers. This is how the completed handle looks when you are storing the parts or taking the plane to the field.



□ 8. For the following building steps it will be better to remove everything from the handle. Do this now and secure the empty handle to the cabanes.

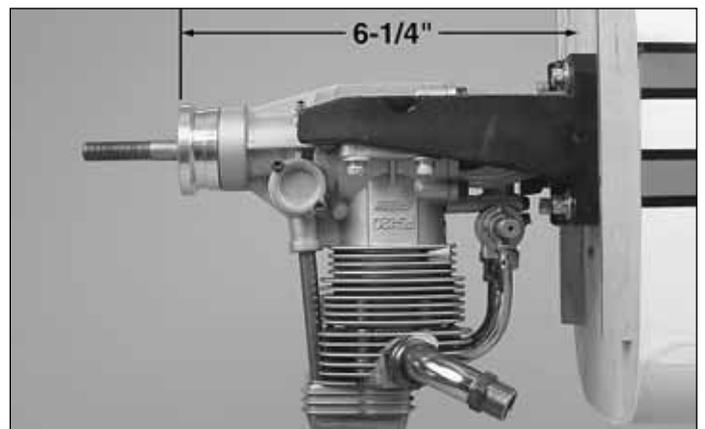
Did you know?... *The primary differences between the “Super Stearman” and the original wartime Stearmans are the larger 450 horsepower Pratt and Whitney engine, additional flying and landing wires, the installation of two additional ailerons on the top wing, cowl and wheel pants!*

Install the Engine & Throttle Servo



□ 1. Cut the tabs from the engine mount. Install the engine mount (inverted) to the firewall with four 8-32 x 1-1/4" [32mm] socket head cap screws, #8 flat washers and #8 lock washers.

□ 2. Position the engine on the mount so the distance from the firewall to the front of the thrust washer measures 6-1/4" [159mm]. Mark the location of the engine on the mount. The Great Planes® Dead Center™ Hole Locator (GPMR8130) works well for this. Drill through the marks you have made on the engine mount with a #29 or 9/64" [3.6mm] drill bit. Tap each of the holes with an 8-32 tap.



□ 3. Install the engine onto the mount with four each, 8-32 x 1" [25mm] socket head cap screws, #8 flat washers and # 8 lock washers.



❑ 4. Drill a 3/16" [4.8mm] hole through the firewall in line with the throttle arm on the carburetor.

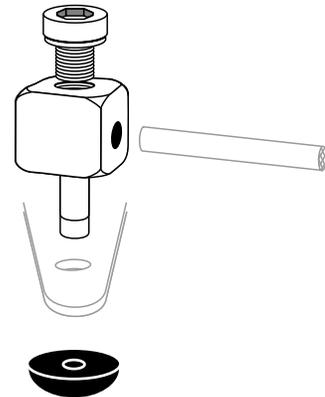
❑ 5. Locate the 24" [610mm] gray plastic pushrod tube and cut it 12-3/4" [324mm] in length. Sand one end of the tube with 220-grit sandpaper. Insert the tube into the firewall. Glue the roughened end of the tube flush to the firewall.



❑ 6. Place your throttle servo into the servo tray as shown. Drill a 1/16" [1.6mm] hole through each of the mounting holes. Remove the servo. Then install and remove a servo mounting screw into each hole. Apply a couple drops of thin CA into the holes to harden the threads. When the glue has cured permanently, mount the servo to the servo tray.

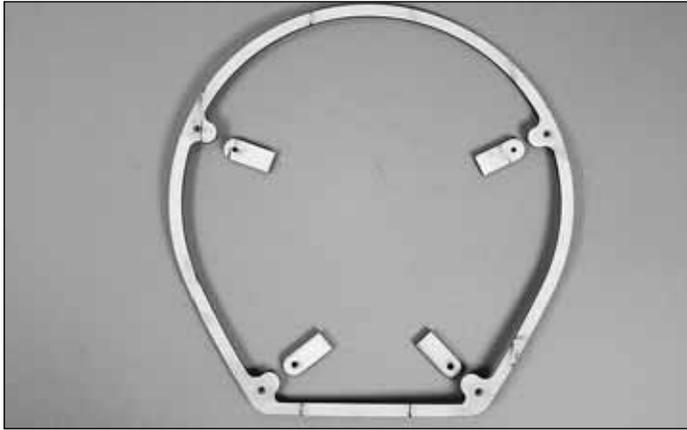


❑ 7. Cut the 1" [25mm] threaded end from the .074" x 17-1/2" [445mm] throttle pushrod wire. Install the wire into the tube and attach it to the servo horn arm with a Faslink. Use the same technique used for the ailerons.

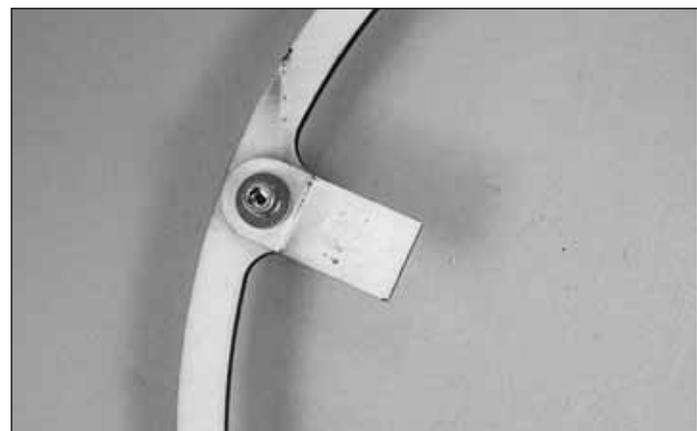


❑ 8. Attach the pushrod wire to the throttle arm with a brass screw-lock connector, nylon retainer ring and a 4-40 x 1/4" [6mm] socket head cap screw.

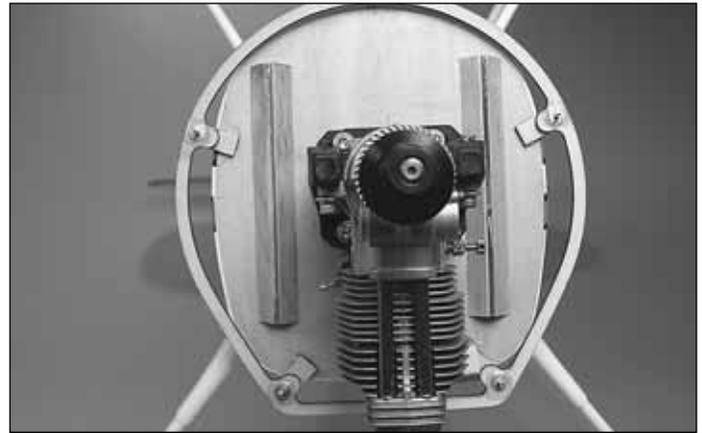
Install the Cowl & Dummy Engine



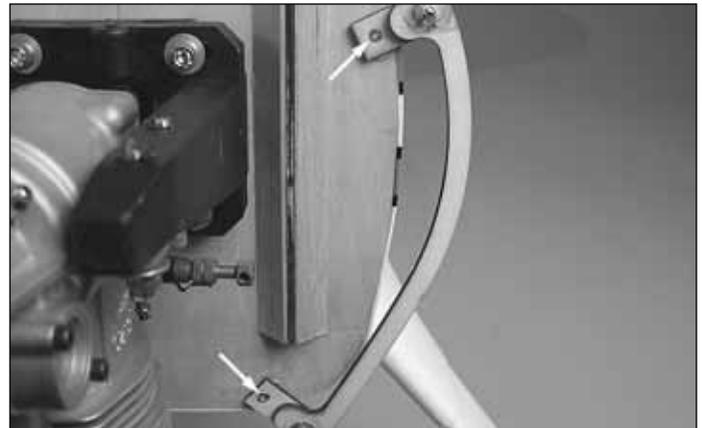
❑ 1. Locate the plywood **cowl ring** and the four **cowl ring mounting tabs**. Note that the cowl ring has blind nuts pre-installed in one side.



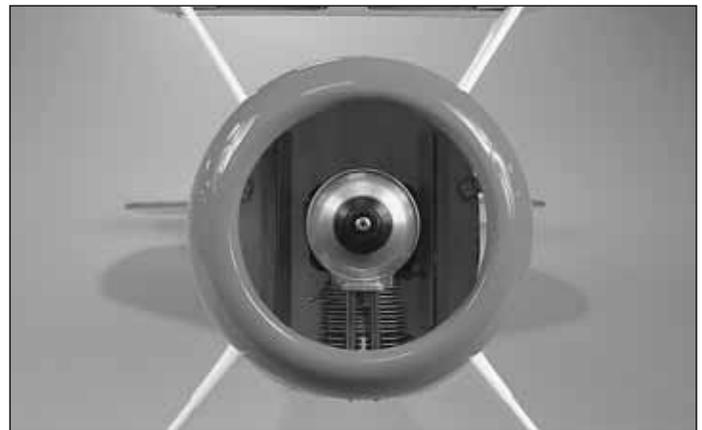
❑ 2. Screw the cowl mounting tabs to the cowl ring with four 4-40 x 1/2" [13mm] socket head cap screw and flat washers. Position the tabs as shown.



❑ 3. Position the cowl ring and the tabs on the reference marks on the front of the firewall. When properly positioned the top of the cowl ring should be flush with the top of the fuselage and the sides should be positioned equally from the sides of the fuselage. When positioning the cowl ring **be sure** that the blind nuts on the cowl ring face forward and the heads of the screws face rearward. Apply CA to the back of the tabs, place the cowl ring and tabs in position on the firewall and hold it in position on the firewall until the glue has cured.



❑ 4. Using a 1/16" [1.6mm] drill bit, drill through each of the four mounting tabs and the firewall. Thread a #2 x 3/8" [9mm] wood screw into each of the holes.



❑ 5. Slide the cowl onto the front of the fuselage. You will probably not be able to slide the cowl into position completely due to the engine making contact with the bottom of the cowl. Slide the cowl on as far as you can,

centering it as much as possible. At the point where the engine begins to make contact with the cowl, mark the inside of the cowl with a felt-tip marker. Make small cut outs in the cowl where the engine contacts the fuselage until you can completely slide the cowl into position. Install the back plate of the spinner and the propeller onto the engine crankshaft. This will help you position the cowl. When centering the cowl, be sure to match the stripes on the side of the cowl with the stripes on the side of the fuselage.

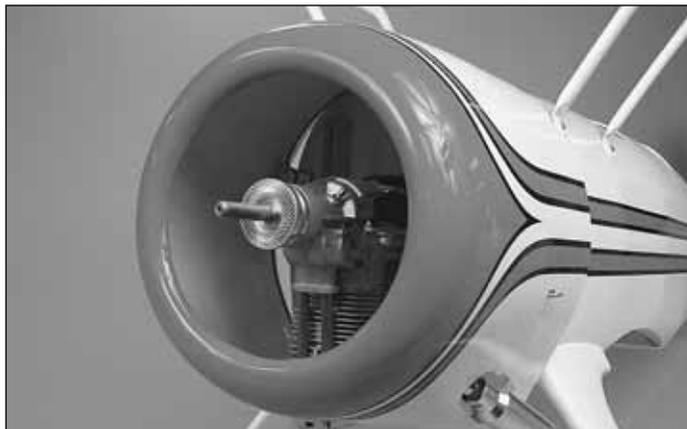


❑ 6. Once you are satisfied with the position of the cowl, tack glue the cowl ring to the cowl with medium CA using a CA applicator tip. Apply the glue on the back of the cowl ring and apply some CA accelerator to the glue to enable it to cure quickly. Do this on both sides of the cowl.

❑ 7. Remove the four screws from the cowl ring, and then remove the cowl from the fuselage.



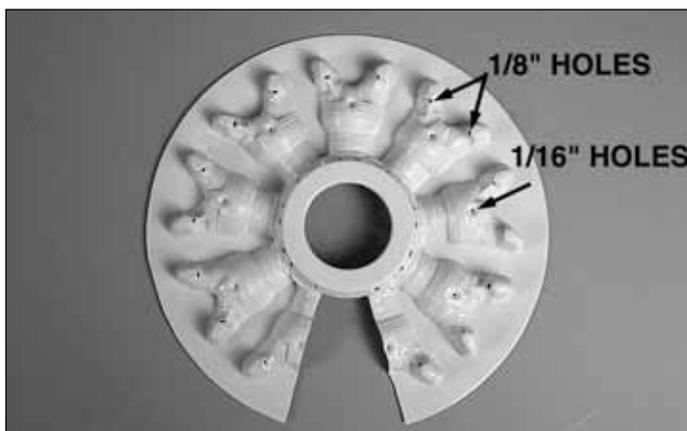
❑ 8. Sand the inside of the cowl, in front of the cowl ring with 220-grit sandpaper. Wipe the area clean with denatured alcohol and allow the area to dry. Mix one ounce of 6-minute epoxy and micro balloons. Apply a fillet of the glue to the cowl and the cowl ring. Set the cowl aside until the glue has cured.



❑ 9. Cut out any areas in the cowl that will be required for the engine cylinder head, muffler, needle valve, remote glow driver, etc. for your particular engine installation.

Note: When positioning your muffler, angle it away from the fiberglass landing gear or plan on using an exhaust diverter. The heat from the muffler will discolor and possibly burn the surface of the gear. After all areas have been removed, re-install the cowl one final time to be sure you are happy with the installation.

❑ 10. Mix 1/4 ounce of 6-minute epoxy with a few drops of denatured alcohol to thin the epoxy. Brush a coat of the mixture on the tabs and the cowl ring to fuelproof the bare wood. Allow the epoxy to fully cure before attaching the cowl to the fuselage. You may wish to rub some talcum powder onto the tabs where they contact the cowl ring to prevent the glue from sticking.

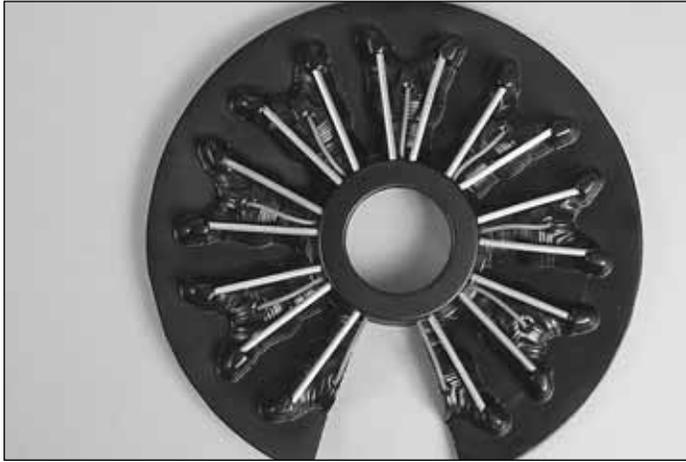


❑ 11. Cut out the center of the **dummy engine**. Slide it over the engine crankshaft. Mark the area where the dummy engine covers the cylinder head of your engine. Remove the dummy engine and cut out the area you marked.

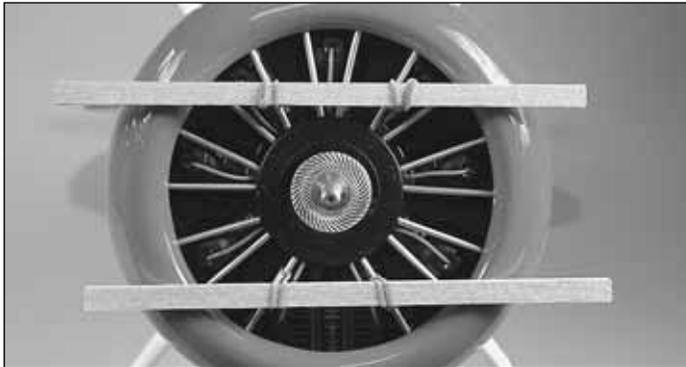
Note: When installing the dummy engine, one cylinder head should be at the top of the cowl. Trim the dummy engine as needed to get it to fit completely forward into the cowl.

❑ 12. Drill 1/8" [3mm] holes in each of the rocker covers and the center of the engine for the aluminum pushrod tubes. If you would like to add some additional detail you may wish to use wire (not included) as a spark plug lead. We used a 20-gauge red wire, then drilled 1/16" [1.6mm] holes in each cylinder for the wire.

Install the Fuel Tank



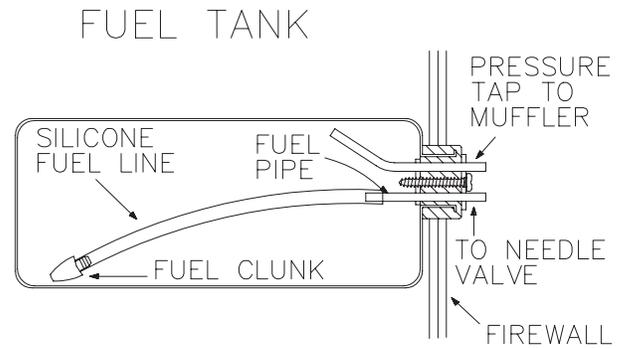
❑ 13. Paint the engine flat black. After the paint dries install the aluminum tubes and wire into the holes you drilled. On the back of the engine apply a small amount of glue to each wire and aluminum tube to hold them in place.



❑ 14. Place the dummy engine over the engine, and then place the cowl over the dummy engine. Attach the cowl to the fuselage with the four socket head cap screws and washers. To position the dummy engine you will need two 9" [229mm] balsa sticks and two small rubber bands (not included). Loop a rubber band through a couple of the aluminum tubes on one side of engine crankshaft. Insert the stick through the rubber bands and place the stick onto the front of the cowl. This will pull the dummy engine into the front of the cowl. Repeat this with the second stick and rubber band on the other side of the engine crankshaft.

❑ 15. Position the dummy engine so that the cut out is over the engine cylinder and the hole you cut in the center of the dummy engine is centered on the engine thrust washer. Be sure the center cylinder on the dummy engine is centered at the top of the fuselage. When you are satisfied with the positioning of the dummy engine, carefully remove the cowl from the fuselage, being careful not to disturb the dummy engine.

❑ 16. Using medium CA, tack-glue the dummy engine to the cowl from inside the cowl. Re-install the cowl to the fuselage to verify that the dummy engine is placed properly. When you are satisfied with the way it fits, remove the cowl from the fuselage. Permanently glue the dummy engine to the cowl from inside the cowl with 6-minute epoxy mixed with microballoons.



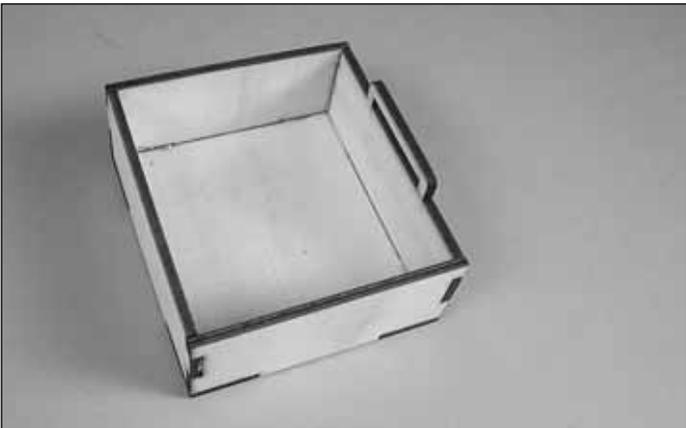
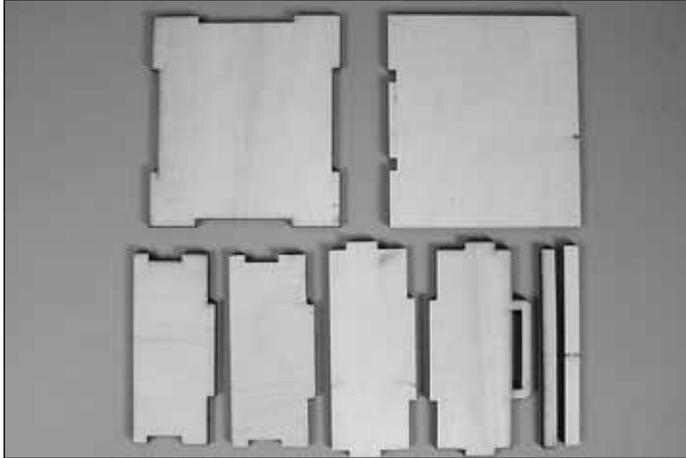
❑ 1. Assemble the **fuel tank** as shown in the sketch. When tightening the center screw be sure not to over tighten it. You just want it snug enough to pull the rubber stopper tight against the tank.

❑ 2. Install the tank into the fuselage with the neck of the tank through the firewall. The tank should fit snug enough to stay in place during the construction process. The tank will be permanently held in place when the battery/receiver tray is installed later.

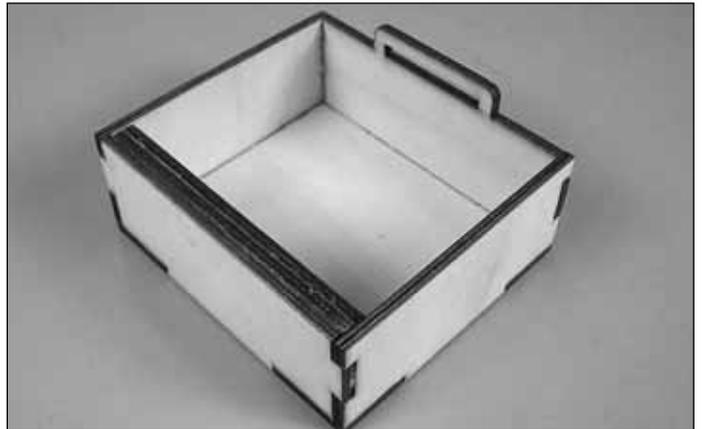
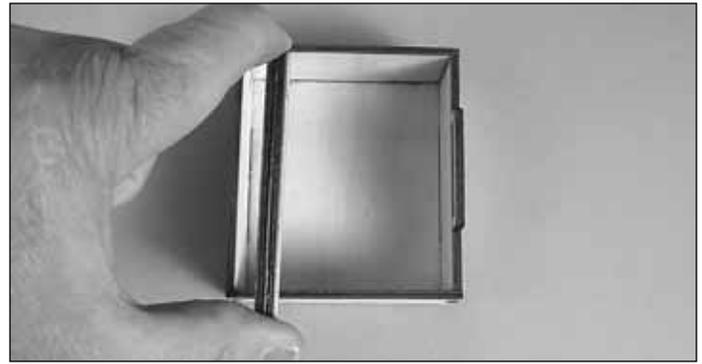
❑ 3. Install silicone fuel tubing onto the aluminum tubes from the fuel tank. The line with the fuel clunk will feed to the fuel inlet at the needle valve and the other will attach to the pressure tap on the muffler. If you choose to use some kind of an external fuel valve, follow the instructions with your particular brand of fuel valve. You can also install a third line to the tank and use it for filling the tank. The method you use is your choice.

Assemble Nose Weight Box

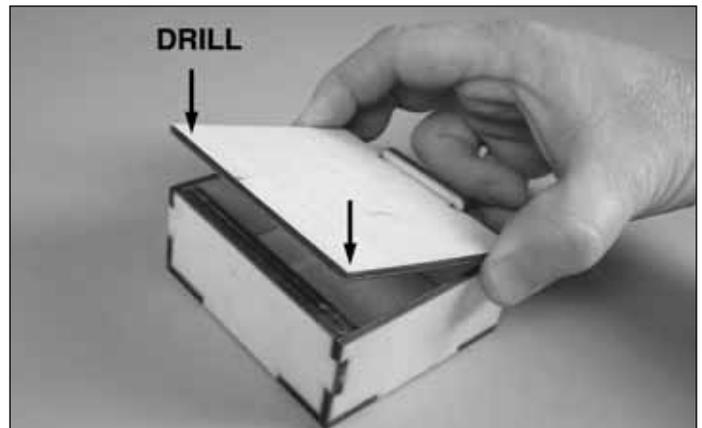
Our prototype model required the addition of nose weight. This is not uncommon for short-coupled airplanes such as the Stearman. We have included a location for you to easily add the weight that most likely will be needed.



❑ 1. Locate the plywood parts that make up the box. Glue the box together as shown. The box will be exposed to engine vibration so be sure you have good glue joints.

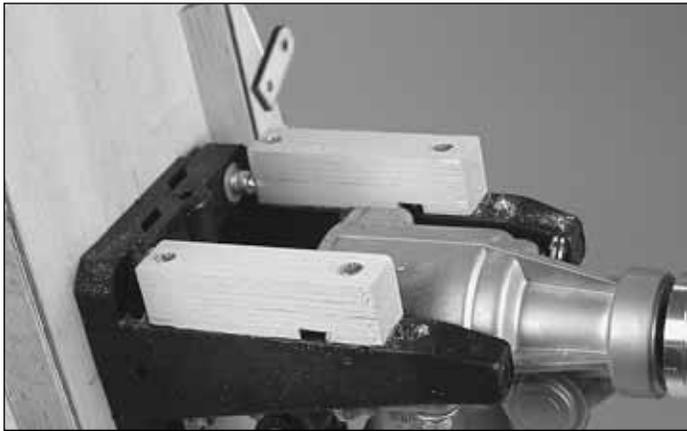


❑ 2. Glue the two 1/8" x 1/4" x 3-1/4" [3 x 6 x 83mm] plywood sticks together. Then glue them to the front of the box.



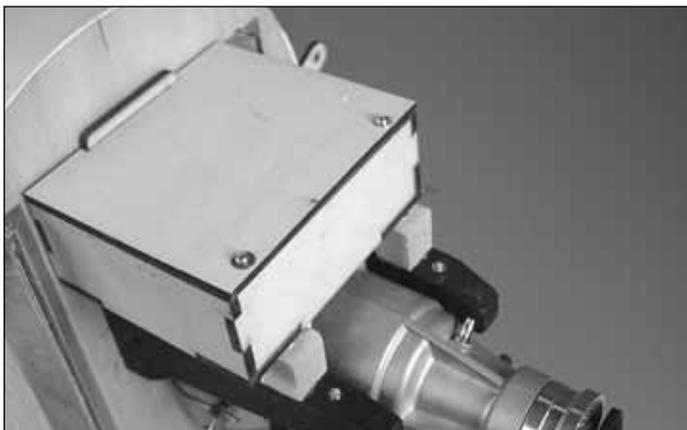
❑ 3. Fit the box cover to the box. Drill a 1/16" [1.6mm] hole at the locations shown. Install and then remove a #2 x 3/8" [10mm] sheet metal screw into each hole. Remove the cover, and then apply a couple of drops of thin CA into the holes in the box to harden the threads.

❑ 4. Referring to the photo on the following page, locate two 1/2" x 11/16" x 2-1/2" [13 x 18 x 64mm] hardwood blocks. Position one of the blocks on the bottom of the engine mount. The block should be resting against the engine mount rail and the socket head cap screw that holds the engine mount to the firewall. You will see that the block cannot sit on the rail because one of the engine mount bolts is extending through the rail. Mark the location of this screw on the block. Where you have marked the block, cut away enough of the wood to provide clearance for the screw, allowing the block to rest against the rail. Repeat this for the remaining block.



❑ 5. Glue the blocks to the engine mount rails with CA. Drill two 3/32" [2.5mm] holes through each of the blocks and the engine mount. Drill a 1/8" [3mm] clearance hole through the **block only!** Do not drill into the engine mount with the 1/8" [3mm] bit! Countersink the top of each of the holes you have drilled so that the screw heads will sit flush with the top of the hardwood blocks. Install a #4 x 1" [25mm] screw into each of the four holes making sure that the head of the screw is flush or slightly below the top of the wood block.

6. Place the box on top of the rails and between the triangle stock located on the firewall. Drill four 1/16" [1.6mm] holes through the inside of the box and into the hardwood rails. Install and then remove a #2 x 3/8" [9mm] wood screw into each of the holes. Remove the box. Apply a couple of drops of thin CA into each of the holes to harden the threads. Allow the glue to cure.



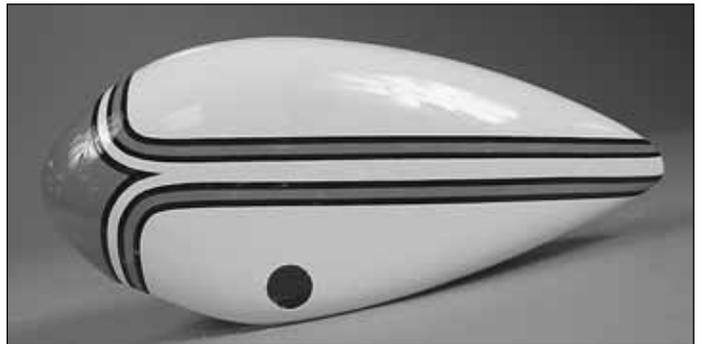
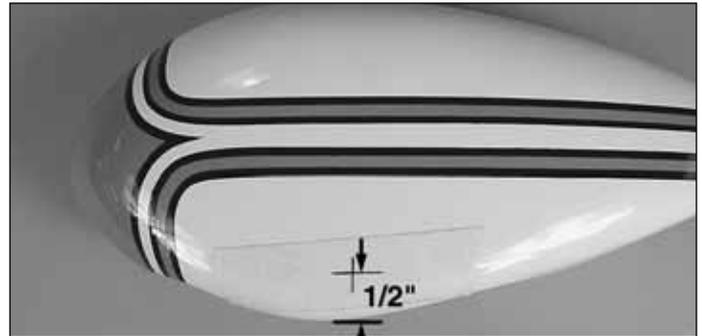
❑ 7. Attach the box to the hardwood blocks. Secure the top of the box with two #2 x 3/8" [10mm] screws and a two #2 washers. Fuelproof the box and rails.

That's it for now for our box for lead. When you get the plane ready for flight you will install the appropriate amount of ballast to balance the plane.

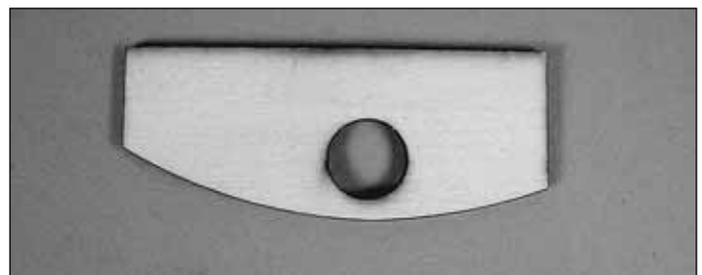
Did you know? Over the years the Stearman has seen duty as a primary trainer, a reconnaissance plane, a crop duster, and an air show performer. In 1934 Argentina, Brazil and the Philippines used Stearmans featuring wing-mounted .30 caliber machine guns, a bomb rack between the landing struts and a single machine gun for the rear!

Install the Wheels & Wheel Pants

❑ 1. Install the **tail wheel** onto the tail wheel wire, securing it with a 3/32" [2.4mm] wheel collar and a 4-40 set screw.



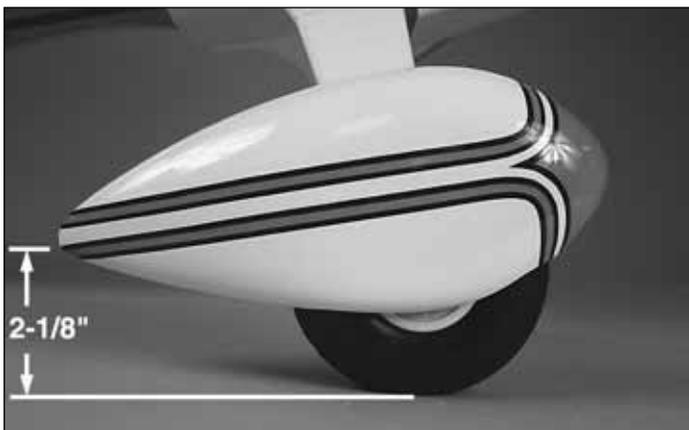
❑ 2. You are going to be doing a left and right **wheel pant**. Be sure you do not make two wheel pants for the same side. Do the **right** side wheel pant first so that your pant matches the pictures. Place a piece of masking tape on the left side of the wheel pant. Make a mark at the center of the wheel opening. Measure up 1/2" [13mm], then make a crossing mark. On this mark make a 1/2" [13mm] diameter hole, using progressively larger drill bits or a rotary tool with a cutting burr.



❑ 3. Sand the inside of the wheel pant on the side with the hole. Wipe the area clean with denatured alcohol. Mix a

1/4 ounce [2cc] of 6-minute epoxy and a small amount of microballoon filler. Locate one of the plywood **wheel pant plates** and glue it inside the pant, aligning the hole in the plate with the hole you made in the side of the pant. Clamp the plate to the pant and allow the glue to fully cure.

□ □ 4. Install the axle and axle nut onto both sides of the landing gear. Slide onto the right axle: the wheel pant, 3/16" [5mm] wheel collar and 6-32 x 1/4" [6mm] socket head cap screw followed by the wheel and another wheel collar and socket head cap screw. Slide the other wheel onto the left axle. Both wheels must be on the axles to assure accuracy of the measurement of the wheel pant in the next step.



□ □ 5. Adjust the wheel pant until the center of the trailing edge of the wheel pant measures 2-1/8" [54mm] from the workbench.



□ □ 6. Holding the wheel pant in that position, drill a 1/16" [1.6mm] hole through each of the mounting holes in the landing gear and into the wheel pant. Secure the pant to the landing gear with two #2 x 1/2" [13mm] screws and #2 washers.



□ □ 7. Center the wheel in the wheel pant with the two wheel collars. Hold the collars in place with the screws. Mark the location where the screw contacts the axle. Remove the wheel pants, wheel and wheel collars from the axle. Apply a couple of drops of thin CA into the two holes you drilled in the wheel pant.



□ □ 8. File a flat spot on the axle on the mark you made. Re-install the wheel pant, wheel and wheel collars onto the axle. Center the wheel and tighten the screws against the axle.

□ □ 9. Repeat steps 1-8 for the left wheel pant.

Install the Radio System

❑ 1. Cut the covering from the pushrod tube openings at the rear of the fuselage. There are two located on the right side and one located on the left. If you have trouble finding the openings, slide a .074" x 36" [1.9 x 915mm] **pushrod wire** into the tubes from inside of the fuselage, sliding it into the tube until it pushes the covering away from the fuselage slightly. This is where you should cut the covering away from the tubes.

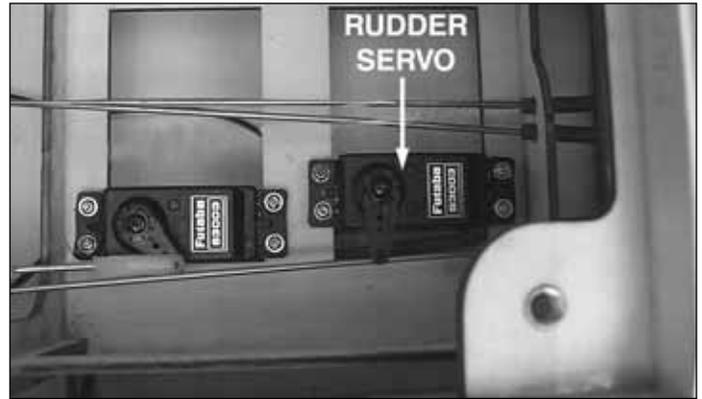
❑ 2. Locate three .074" x 36" [1.9 x 915mm] **pushrod wires** threaded on one end. Thread a nylon clevis onto the threaded end of each wire 20 full turns. Install a silicone clevis keeper onto the clevis.



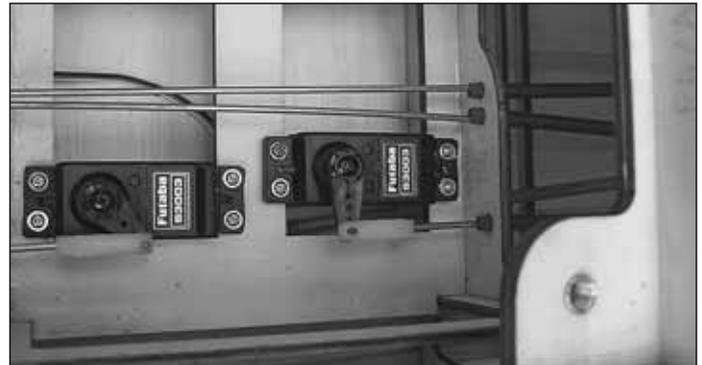
❑ 3. On the right side of the fuselage, slide one wire into the opening closest to the back of the fuselage. Install a nylon control horn onto the clevis. Position the control horn on the rudder, positioning it the same way you did with the ailerons. Mark the location for the screw holes. Drill through the marks you made with a 1/16" [1.6mm] drill bit, drilling only into the plywood plate. **Do not** drill through the rudder! Install and then remove two 2-56 x 5/8" [16mm] machine screws. Apply a couple drops of thin CA into the holes. Once the glue has cured, mount the horn and the nylon mounting plate to the rudder with the screws.



❑ 4. Install the two elevator pushrods using the same procedure used for the rudder. Be sure when installing the control horn on the right elevator that you install it so it does not conflict with the rudder control horn.



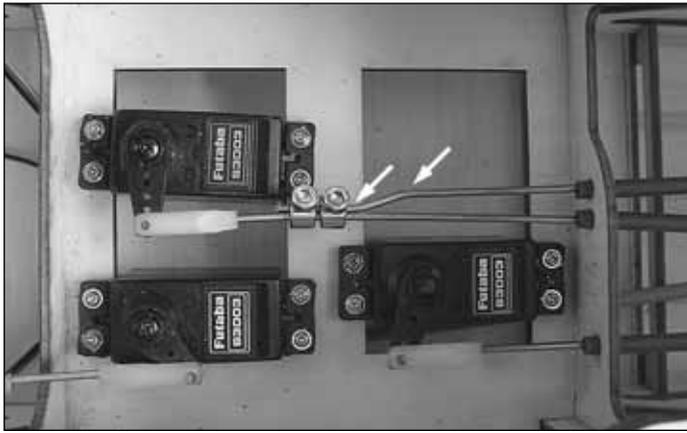
❑ 5. Place your rudder servo into the servo tray as shown, positioning the last hole of the servo arm over the pushrod wire. Drill a 1/16" [1.6mm] hole through each of the mounting holes. Remove the servo, then install and remove a servo mounting screw into each hole. Apply a couple drops of thin CA into the holes to harden the threads. When the glue has cured, permanently mount the servo to the servo tray.



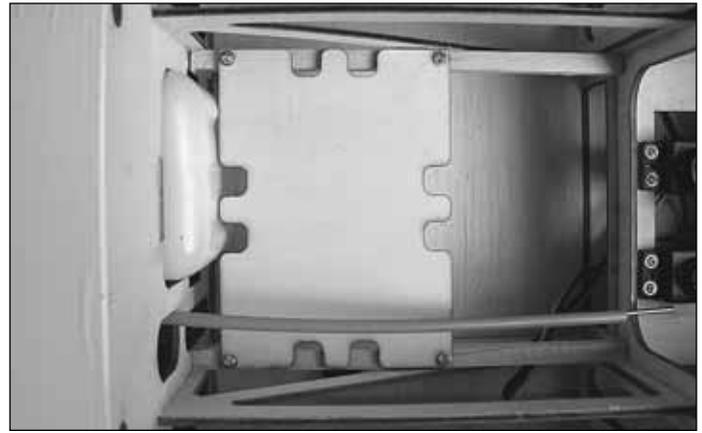
❑ 6. Center the rudder and the rudder servo, then install the servo arm. At the point the pushrod wire intersects the last hole in the servo arm make a mark. Bend the wire 90 degrees on that mark. Install a nylon Faslink and cut off the excess wire the same as was done with the throttle servo.



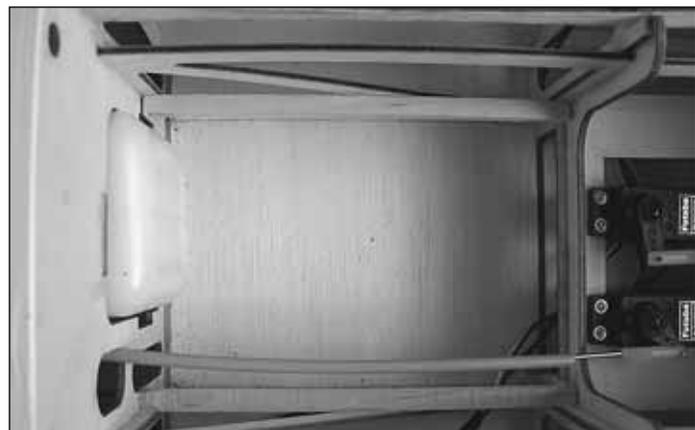
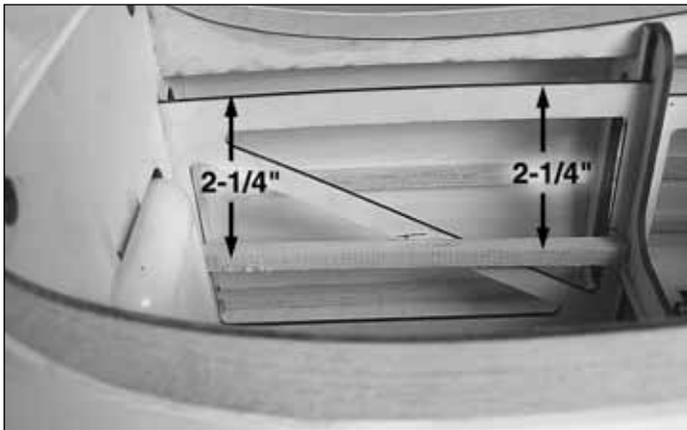
❑ 7. Place your elevator servo into the servo tray as shown, positioning the last hole of the servo arm over the inside pushrod wire. Drill a 1/16" [1.6mm] hole through each of the mounting holes. Remove the servo, then install and remove a servo mounting screw into each hole. Apply a couple drops of thin CA into the holes to harden the threads. When the glue has cured permanently, mount the servo to the servo tray.



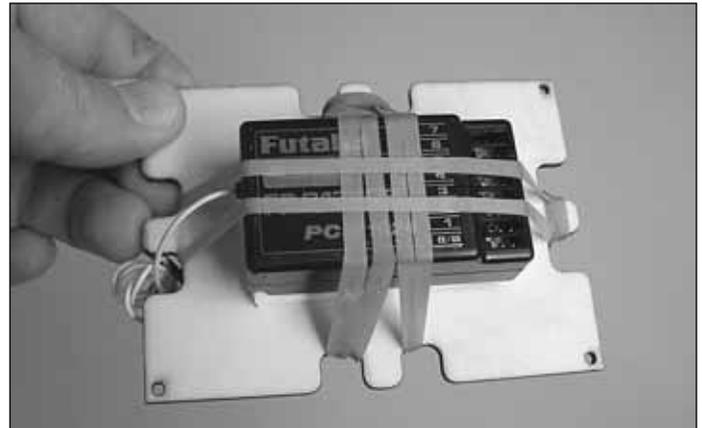
□ 8. Bend the outer elevator pushrod as shown. Cut off the excess wire. Center both of the elevators, then center the elevator servo. Secure the two pushrod wires with two 5/32" [4mm] wheel collars and 6-32 x 1/4" [6mm] socket head cap screws. Attach the elevator pushrod to the servo arm with a nylon Faslink using the same technique used on the rudder and throttle.



□ 10. Locate the 1/8" [3mm] plywood **receiver/battery tray**. Place it on top of the hardwood sticks you glued in and place the tray against the fuel tank to keep the fuel tank in position. Drill a 1/16" [1.6mm] hole through the mounting holes in the tray and into the hardwood sticks. Insert and then remove a #2 x 3/8" [9mm] screw into each of the holes. Then apply a couple of drops of thin CA into the holes to harden the threads. Once the glue has cured the tray can be mounted with four #2 x 3/8" [9mm] sheet metal screws and #2 washers. Do not install the tray at this time.



□ 9. Measure down 2-1/4" [57mm] from the top of the fuselage former and make a line on the former. Do this on both sides of the fuselage. Locate two 1/4" x 1/4" x 6" [6 x 6 x 154mm] hardwood sticks. Securely glue them to the former aligning the top of the stick with the lines you marked on the formers.

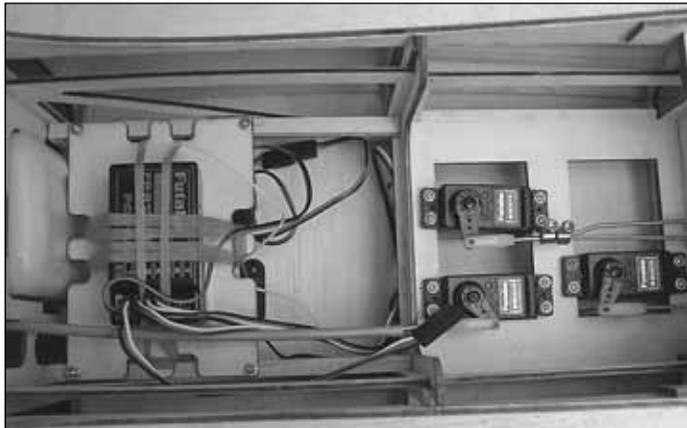


□ 11. On one side of the tray, place 1/4" [6mm] foam between the receiver and the tray. On the other side place 1/4" [6mm] foam between the tray and the battery pack. Use #64 rubber bands to hold the receiver and battery to the tray.



❑ 12. We installed the radio switch and the battery charge jack inside the front cockpit. Place a pilot in the cockpit as your guide for positioning the switch and charge jack.

❑ 13. Connect the battery to the switch and secure the ends of the leads with heat shrink tubing, tape or some other method for securing the leads.



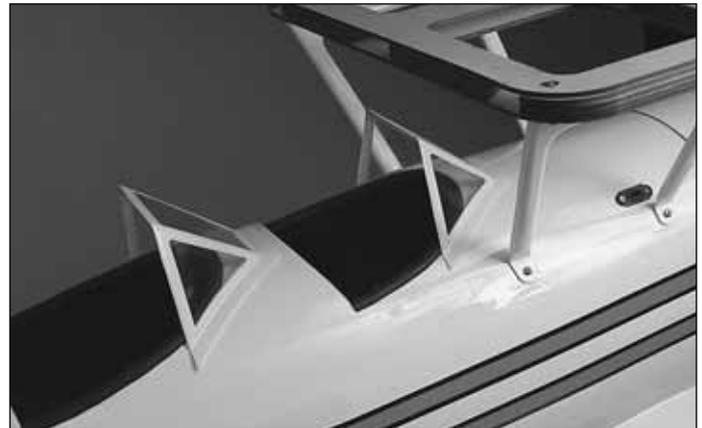
❑ 14. Install the tray as shown and secure it to the rails with the #2 x 3/8" [9mm] sheet metal screws and #2 washers. Plug your servos and battery into the receiver. Route the receiver antenna into the antenna tube located under the servo tray. Slide the antenna completely into the tube. The fuselage and antenna tube are long enough that the antenna will not exit the fuselage.

Finishing Touches

❑ 1. Paint the cockpits flat black.



❑ 2. Locate two pieces of black **cockpit coaming**. Look closely and you will see that there is a slit in it. Slide the coaming onto the edge of the cockpits. Glue it in place with R/C 56 canopy glue. This glue sticks well to MonoKote eliminating the need to cut any covering, exposing wood in order to get a good bond.

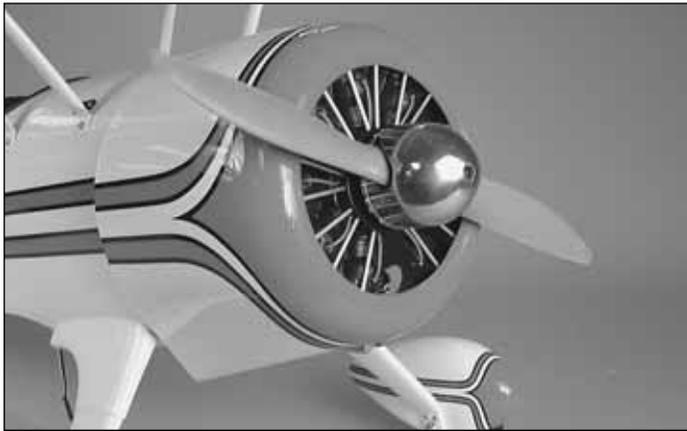


❑ 3. Cut the windscreens on the cut lines. Glue them in place with R/C 56 canopy glue.



❑ 4. Glue the turtle deck in place with R/C 56 canopy glue.

❑ 5. Your kit includes two pilots. Glue one in each cockpit with 6-minute epoxy.



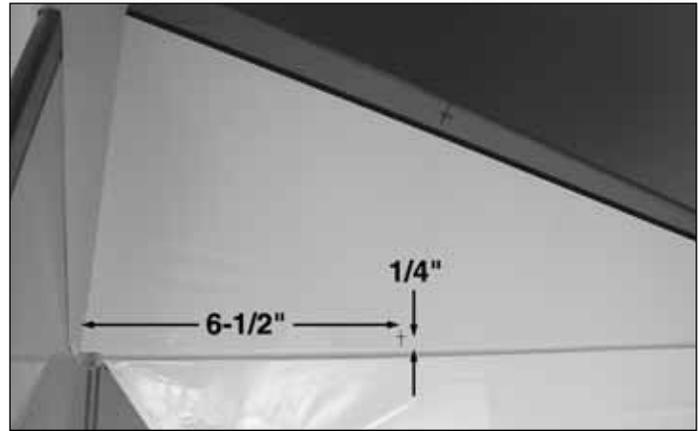
❑ 6. Install the spinner with the prop appropriate to your engine. The spinner includes a spinner nut that will fit the O.S.[®] .91 two-stroke and the 1.20 four-stroke engines. The spinner bolt may be too long for some installations. Cut the bolt as needed to fit your particular application. Spinner nuts for other engines are available from Great Planes, CB Associates and True Turn.

Optional Flying Wire Installation

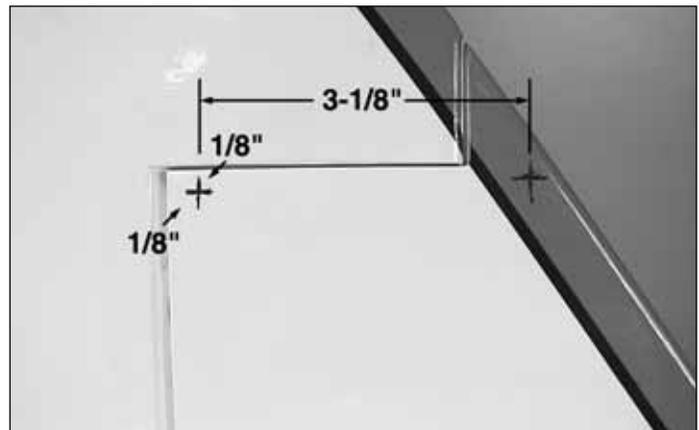
The photos on the box show optional flying wires installed on the plane. The materials we used for this are not included in the kit but are readily available at any fabric store for less than \$10.00. The wires are made from an elastic cord typically used for sewing an elastic cuff in a sleeve. The material is commonly called, "Beading Cord Elastic".



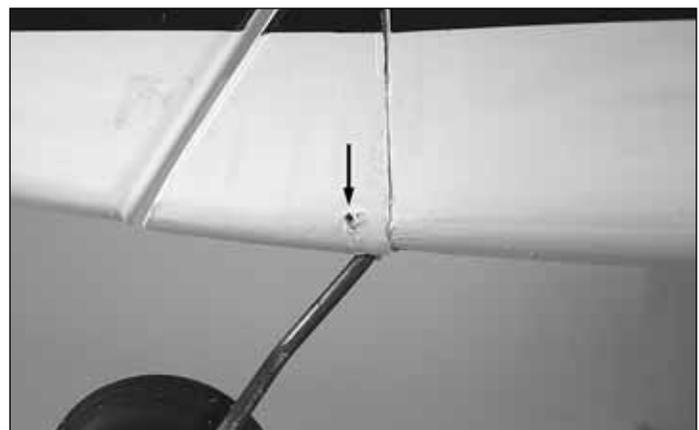
You will need approximately seven yards, two small packages. The method described here will provide a reasonably scale appearance without the hassles typically associated with flying wires. Because they are made from elastic there is no need to tension them each time you put the plane together. These wires will add approximately two minutes to the overall assembly time of the plane at the flying field.



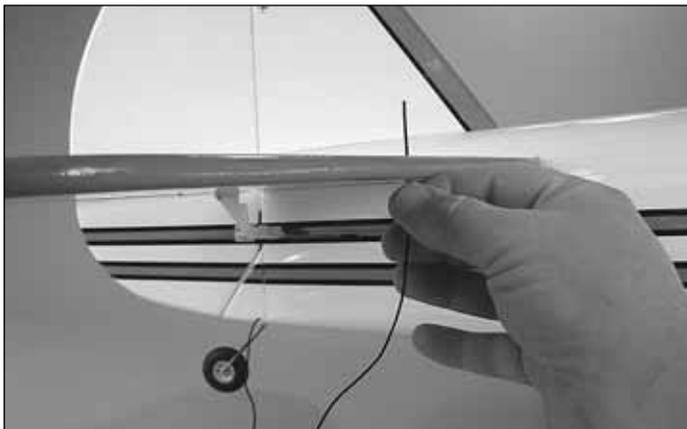
❑ ❶ 1. Measure from the fillet at the trailing edge of the stab out toward the tip of the stab 6-1/2" [165mm] and make a mark with a felt-tip pen. Measure in from the trailing edge of the stab 1/4" [6mm] and make a crossing mark. Do the same on the leading edge of the stab. Do this on both sides of the stab.



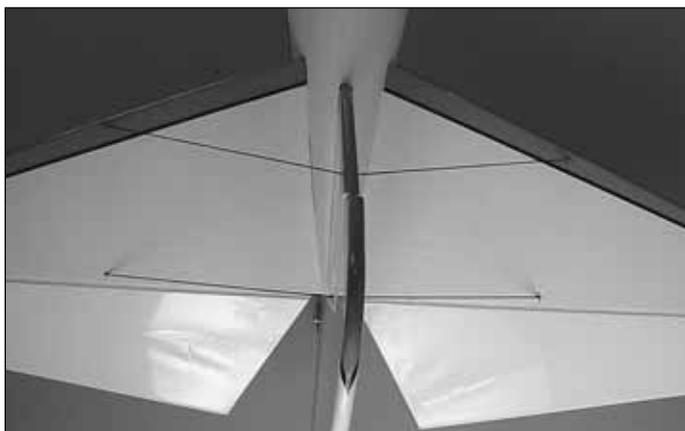
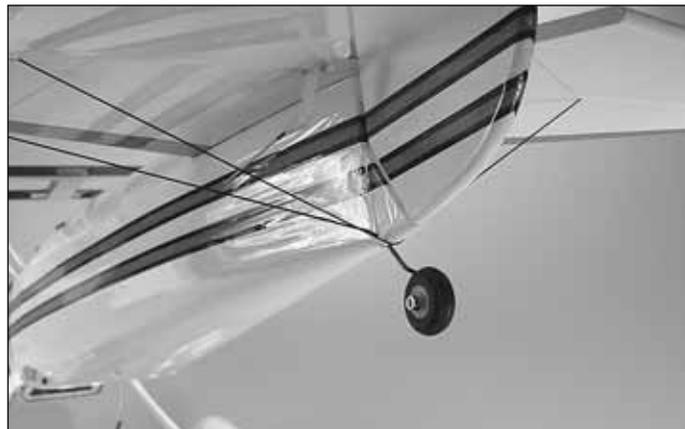
❑ ❷ 2. At the rear corner of the fin, measure down and in 1/8" [3mm]. From the intersection of those lines make a mark on the front of the fin 3-1/8" [79mm]. On the marks, drill a hole through the fin with a 5/64" [2mm] drill.



❑ ❸ 3. Drill a 5/64" [2mm] hole through the block at the back of the fuselage.



□ □ 4. Cut a piece of the elastic cord 50" [1270mm] long. This length should be relaxed, not stretched. In order to feed the elastic cord through the holes you have drilled, apply a few drops of thin CA to one end of the elastic cord, covering approximately 1" [25mm] of the cord. On the opposite end of the cord put a small drop of CA, just enough to make the end of the cord hard. On this end of the cord, apply a small drop of CA to the end and insert it into the hole in the block. Hold the cord in place until the glue cures. Thread the opposite end of the cord through the hole in the leading edge of the stab as shown.



□ □ 7. At this point you will have to start stretching the elastic to complete the positioning of the elastic cord. Pull the cord around the tail wheel wire, then thread the cord through the trailing edge of the stab and fin back to the hole you drilled through in the block at the back of the fuselage.



□ □ 5. Thread the cord through the hole in the leading edge of the fin.



□ □ 6. Continue threading the cord through the hole in the leading edge of the stab on the opposite side of the fuselage.



□ □ 8. Make two marks 1/2" [13mm] apart 1/4" [6mm] above the landing gear. Drill partially into the fuselage on each of the four marks 5/64" [2mm].



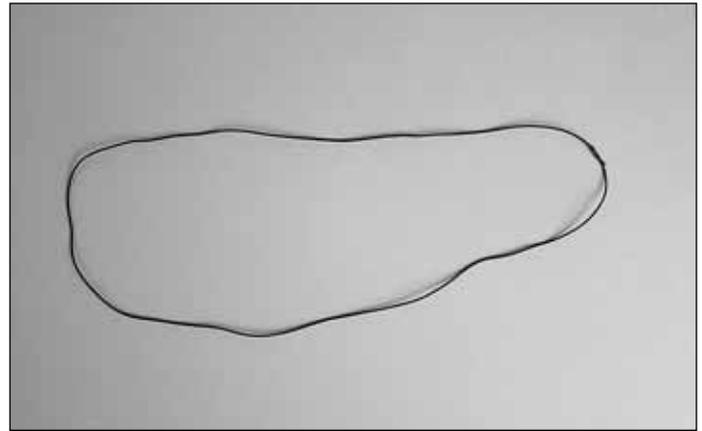
□ □ 9. Put a small drop of CA on the cord, then insert it into the hole shown.



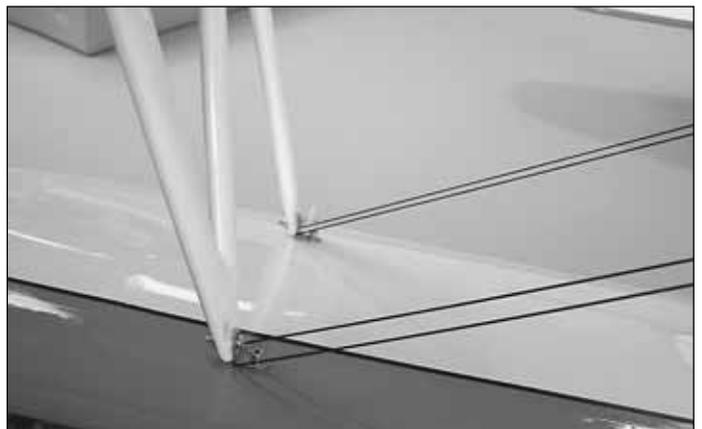
□ □ 10. Bring the elastic cord around the top of the forward strut and pull it back toward the fuselage. Glue the cord into the hole next to the hole you started with



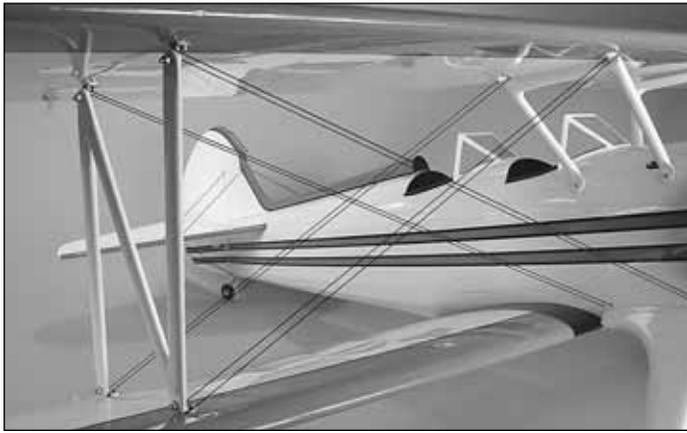
□ □ 11. Repeat this process for the rear strut.



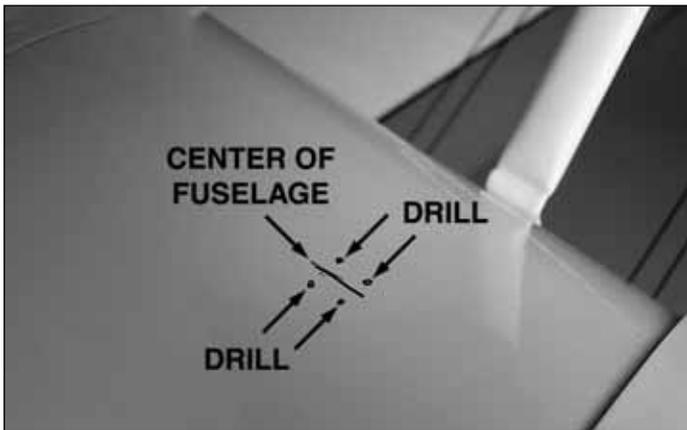
□ □ 12. Cut two elastic cords 25" [635mm] long. Use CA to glue the ends together forming a loop. When gluing the ends together, overlap the cord approximately 1/2" [13mm].



□ □ 13. Remove the screws from the top cabanes, install the cord around the cabane and then re-install the screws. Do this on the bottom of the wing struts as well.



❑ 14. This completes the wires for the right side. Repeat steps 1-13 for the opposite side.



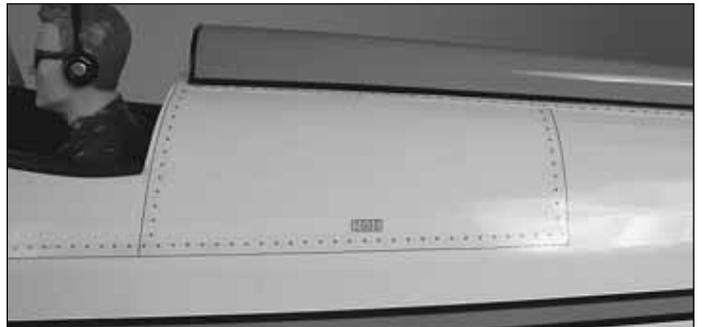
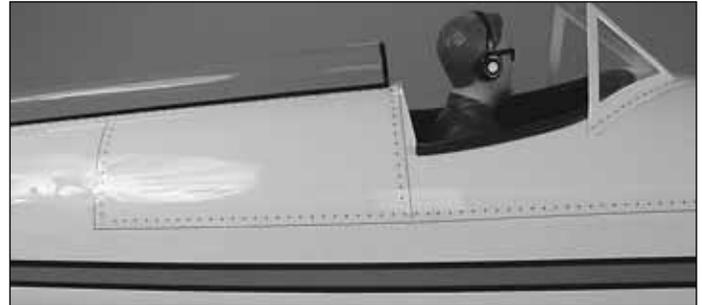
❑ 15. Make a mark identifying the top center of the fuselage. Mark four holes as shown. Drill partially into the fuselage with a 5/64" [2mm] drill on each of the four marks.



❑ 16. Cut four pieces of elastic cord 4" [100mm] long. Glue a cord into each of the four holes. Stretch the cord to the top of the cabane and glue the cord to the cabane with a small drop of CA.

Apply the Decals

The Stearman was primarily a fabric-covered aircraft, but there were some panel lines along the top of the fuselage. In addition to the photographs on the box the following pictures should help you in the placement of the decals.



❑ 1. Use scissors or a sharp hobby knife to cut the decals from the sheet.

❑ 2. Be certain the model is clean and free from oily fingerprints and dust. Prepare a dishpan or small bucket with a mixture of liquid dish soap and warm water—about one teaspoon of soap per gallon of water. Submerge the decal in the soap and water and peel off the paper backing.

Note: Even though the decals have a “sticky-back” and are not the water transfer type, submersing them in soap & water allows accurate positioning and reduces air bubbles underneath.

❑ 3. Position decals on the model as shown on the box cover. Holding the decal down, use a paper towel to wipe most of the water away.

❑ 4. Use a piece of soft balsa or something similar to squeegee remaining water from under the decal. Apply the rest of the decals the same way.

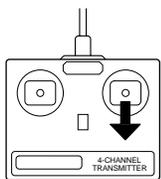
GET THE MODEL READY TO FLY

Check the Control Directions

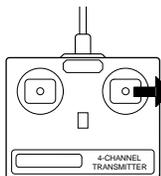
- ❑ 1. Turn on the transmitter and receiver and center the trims. If necessary, remove the servo arms from the servos and reposition them so they are centered. Reinstall the screws that hold on the servo arms.

- ❑ 2. With the transmitter and receiver still on, check all the control surfaces to see if they are centered. If necessary, adjust the clevises on the pushrods to center the control surfaces.

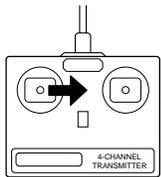
4-CHANNEL RADIO SETUP (STANDARD MODE 2)



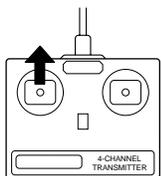
ELEVATOR MOVES UP



RIGHT AILERON MOVES UP
LEFT AILERON MOVES DOWN



RUDDER MOVES RIGHT



CARBURETOR WIDE OPEN

- ❑ 3. Make certain that the control surfaces and the carburetor respond in the correct direction as shown in the diagram. If any of the controls respond in the wrong direction, use the servo reversing in the transmitter to reverse the servos connected to those controls. Be certain the control surfaces have remained centered. Adjust if necessary.

Set the Control Throws



Use a Great Planes AccuThrow (or a ruler) to accurately measure and set the control throw of each control surface as indicated in the chart that follows. If your radio does not have dual rates, we recommend setting the throws at the **low** rate setting.

NOTE: The throws are measured at the **widest part** of the elevators, rudder and ailerons.

These are the recommended control surface throws:

	High Rate	Low Rate
ELEVATOR	1" [25mm] up 1" [25mm] down	7/8" [22mm] up 7/8" [22mm] down
RUDDER	1-1/2" [38mm] right 1-1/2" [38mm] left	1" [25mm] right 1" [25mm] left
AILERONS		
Bottom Wing	1" [25mm] up 1" [25mm] down	9/16" [14mm] up 9/16" [14mm] down
Top Wing	1-1/4" [32mm] up 1-1/2" [38mm] down	3/4" [19mm] up 7/8" [22mm] down

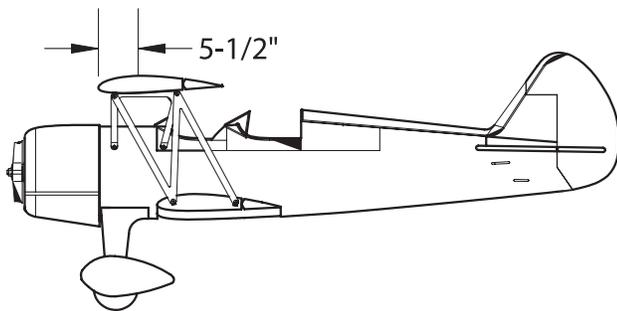
NOTE: The aileron throws shown for the top wing represents the differential created by using the aileron connecting rod. If you are using four servos instead of two you do not necessarily need to create the differential in movement shown here. The control throws up and down can be the same. Use the greater of the two throws when setting up the servos on the top wing.

IMPORTANT: The Stearman has been **extensively** flown and tested to arrive at the throws at which it flies best. Flying your model at these throws will provide you with the greatest chance for successful first flights. If, after you have become accustomed to the way the Stearman flies, you would like to change the throws to suit your taste, that is fine. However, too much control throw could make the model difficult to control, so remember, "more is not always better."

Balance the Model (C.G.)

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.

At this stage the model should be in ready-to-fly condition with all of the systems in place including the engine, landing gear, covering, and the radio system. The Stearman is a short-coupled airplane making it nearly impossible to balance without the addition of some nose weight. Earlier you installed a box to hold lead. Remove the spinner and cowl. Remove the cover from the box and install lead. Great Planes (GPMQ4485) "stick-on" lead works well. All of our prototypes had an O.S. 120 four-stroke engine and required approximately 18 oz. of lead. This should be a good starting point for balancing your plane too. After putting the lead in the box be sure to re-install the cowl, spinner and propeller. After you install nose weight, pack the inside of the box tight with foam rubber to prevent any lead from coming loose and rattling around inside the box



1. Use a felt-tip pen or 1/8" [2mm] wide tape to accurately mark the C.G. on the bottom of the top wing (on both sides of the fuselage.) The C.G. is located 5-1/2" [140mm] back from the leading edge of the top wing.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 3/8" [9mm] forward or 3/8" [9mm] back to change the flying characteristics. Moving the C.G. forward may improve the smoothness and stability, but the model may then require more speed for take off and make it more difficult to slow for landing. Moving the C.G. aft makes the model more maneuverable, but could also cause it to become too difficult to control. In any case, **start at the recommended balance point** and do not at any time balance the model outside the specified range.

2. With the wing attached to the fuselage, all parts of the model installed (ready to fly) and an empty fuel tank, lift it at the balance point you marked.

3. If the tail drops, the model is "tail heavy" and the battery pack and/or receiver must be shifted forward or weight must be added to the nose to balance. If the nose drops, the model is "nose heavy" and the battery pack and/or receiver must be shifted aft or weight must be added to the tail (or removed from the weight box) to balance.

4. **IMPORTANT:** If you found it necessary to add any weight, recheck the C.G. after the weight has been installed.

Balance the Model Laterally

1. With the wings level, have an assistant help you lift the model by the engine propeller shaft and the bottom of the fuse under the TE of the fin. Do this several times.

2. If one wing always drops when you lift the model, it means that side is heavy. Balance the airplane by adding weight to the other wing tip. **An airplane that has been laterally balanced will track better in loops and other maneuvers.**

PREFLIGHT

Identify Your Model

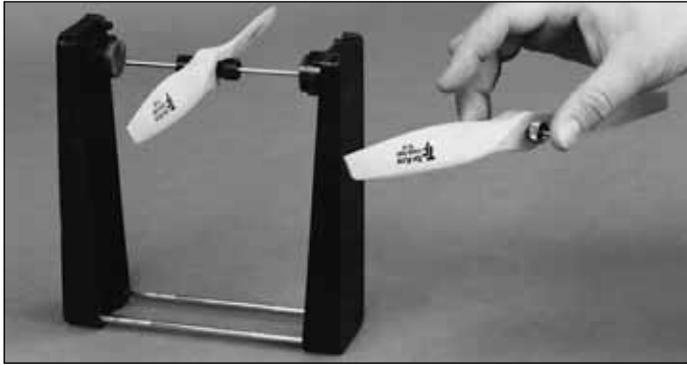
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events. Fill out the identification tag on the decal sheet and place it on or inside your model.

Charge the Batteries

Follow the battery charging instructions that came with your radio control system to charge the batteries. You should always charge your transmitter and receiver batteries the night before you go flying, and at other times as recommended by the radio manufacturer.

NOTE: Checking the condition of your receiver battery pack is **highly recommended.** All battery packs, whether it's a trusty pack you've just taken out of another model, or a new battery pack you just purchased, should be cycled, noting the discharge capacity. Oftentimes, a weak battery pack can be identified (and a valuable model saved!) by comparing its actual capacity to its rated capacity. Refer to the instructions and recommendations that come with your cycler. If you don't own a battery cycler, perhaps you can have a friend cycle your pack and note the capacity for you.

Balance the Propellers



Carefully balance your propeller and spare propellers before you fly. An unbalanced prop can be the single most significant cause of vibration that can damage your model. Not only will engine mounting screws and bolts loosen, possibly with disastrous effect, but vibration may also damage your radio receiver and battery. Vibration can also cause your fuel to foam, which will, in turn, cause your engine to run hot or quit.

We use a Top Flite Precision Magnetic Prop Balancer™ (TOPQ5700) in the workshop and keep a Great Planes Fingertip Prop Balancer (GPMQ5000) in our flight box.

Ground Check

If the engine is new, follow the engine manufacturer's instructions to break-in the engine. After break-in, confirm that the engine idles reliably, transitions smoothly and rapidly to full power and maintains full power—indefinitely. After you run the engine on the model, inspect the model closely to make sure all screws remained tight, the hinges are secure, the prop is secure and all pushrods and connectors are secure.

Range Check

Ground check the operational range of your radio before the first flight of the day. With the transmitter antenna collapsed and the receiver and transmitter on, you should be able to walk at least 100 feet away from the model and still have control. Have an assistant stand by your model and, while you work the controls, tell you what the control surfaces are doing. Repeat this test **with the engine running** at various speeds with an assistant holding the model, using hand signals to show you what is happening. If the control surfaces do not respond correctly, **do not fly!** Find and correct the problem first. Look for loose servo connections or broken wires, corroded wires on old servo connectors, poor solder joints in your battery pack or a defective cell, or a damaged receiver crystal from a previous crash.

ENGINE SAFETY PRECAUTIONS

Failure to follow these safety precautions may result in severe injury to yourself and others.

Keep all engine fuel in a safe place, away from high heat, sparks or flames, as fuel is very flammable. Do not smoke near the engine or fuel; and remember that engine exhaust gives off a great deal of deadly carbon monoxide. Therefore **do not run the engine in a closed room or garage.**

Get help from an experienced pilot when learning to operate engines.

Use safety glasses when starting or running engines.

Do not run the engine in an area of loose gravel or sand; the propeller may throw such material in your face or eyes.

Keep your face and body as well as all spectators away from the plane of rotation of the propeller as you start and run the engine.

Keep these items away from the prop: loose clothing, shirt sleeves, ties, scarfs, long hair or loose objects such as pencils or screwdrivers that may fall out of shirt or jacket pockets into the prop.

Use a “chicken stick” or electric starter to start the engine. Do not use your fingers to flip the propeller. Make certain the glow plug clip or connector is secure so that it will not pop off or otherwise get into the running propeller.

Make all engine adjustments from behind the rotating propeller.

The engine gets hot! Do not touch it during or right after operation. Make sure fuel lines are in good condition so fuel will not leak onto a hot engine, causing a fire.

To stop a glow engine, cut off the fuel supply by closing off the fuel line or following the engine manufacturer's recommendations. Do not use hands, fingers or any other body part to try to stop the engine. To stop a gasoline powered engine an on/off switch should be connected to the engine coil. Do not throw anything into the propeller of a running engine.

AMA SAFETY CODE (excerpts)

Read and abide by the following Academy of Model Aeronautics Official Safety Code:

GENERAL

1. I will not fly my model aircraft in sanctioned events, air shows, or model flying demonstrations until it has been proven to be airworthy by having been previously successfully flight tested.
2. I will not fly my model aircraft higher than approximately 400 feet within 3 miles of an airport without notifying the airport operator. I will give right of way to, and avoid flying in the proximity of full scale aircraft. Where necessary an observer shall be used to supervise flying to avoid having models fly in the proximity of full scale aircraft.
3. Where established, I will abide by the safety rules for the flying site I use, and I will not willfully and deliberately fly my models in a careless, reckless and/or dangerous manner.
7. I will not fly my model unless it is identified with my name and address or AMA number, on or in the model.
9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind).

RADIO CONTROL

1. I will have completed a successful radio equipment ground check before the first flight of a new or repaired model.
2. I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.
3. I will perform my initial turn after takeoff away from the pit or spectator areas, and I will not thereafter fly over pit or spectator areas, unless beyond my control.
4. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission...

IMAA SAFETY CODE (excerpts)

Since the Stearman qualifies as a "giant scale" model and is therefore eligible to fly in IMAA events, we've included excerpts from the IMAA Safety Code.

Definition: For the purpose of the following IMAA Safety Code, the term Giant Scale shall refer to radio controlled model aircraft, either scale or non-scale, which have a wingspan of 80 inches or more for monoplanes and 60 inches or more for multi-winged model aircraft and have a ramp weight (fueled and ready to fly) of 55 lbs. or less.

Section 1.0: SAFETY STANDARD

- 1.1 Adherence to Code: This safety code is to be strictly followed
- 1.2 The most current AMA Safety Code in effect is to be observed. However, the competition sections of the code may be disregarded.

Section 3.0: Safety Check

3.4 Flight Testing: All Giant Scale R/C aircraft are to have been flight tested and flight trimmed with a minimum of six flights before the model is allowed to fly at an IMAA Sanctioned event.

3.5 Proof of Flight: The completing and signing of the Declaration section of the Safety Inspection form by the pilot (or owner) shall document as fact that each aircraft has been successfully flight-tested and proven airworthy prior to an IMAA event.

Section 5.0: EMERGENCY ENGINE SHUT OFF (kill switch)

5.1 All magneto spark ignition engines must have a coil grounding switch on the aircraft to stop the engine. This will also prevent accidental starting of the engine. This switch shall be readily available to both pilot and helper. This switch is to be operated manually and without the use of the radio system.

5.2 Engines with battery power ignition systems must have a switch to turn off the power from the battery pack to disable the engine from firing. This will also prevent accidental starting of the engine. This switch shall be readily available to both pilot and helper. This switch shall be operated manually and without the use of the Radio System.

5.3 There must also be a means to stop the engine from the transmitter. The most common method is to close the carburetor throat completely using throttle trim, however, other methods are acceptable. This requirement applies to all glow/gas ignition engines regardless of size.

Section 6.0: RADIO REQUIREMENTS

6.1 All transmitters must be FCC type certified.

6.2 FCC Technician or higher-class license required for 6 meter band operation only.

CHECK LIST

During the last few moments of preparation your mind may be elsewhere anticipating the excitement of the first flight. Because of this, you may be more likely to overlook certain checks and procedures that should be performed before the model is flown. To help avoid this, a checklist is provided to make sure these important areas are not overlooked. Many are covered in the instruction manual, so where appropriate, refer to the manual for complete instructions. Be sure to check the items off as they are completed.

- 1. Fuelproof all areas exposed to fuel or exhaust residue such as the cowl ring, cowl mounting blocks, wing saddle area, etc.
- 2. Check the C.G. according to the measurements provided in the manual.
- 3. Be certain the battery and receiver are securely mounted in the fuse. Simply stuffing them into place with foam rubber is not sufficient.
- 4. Extend your receiver antenna and make sure it is in the antenna tube..
- 5. Balance your model *laterally*.
- 6. Use threadlocking compound to secure critical fasteners such as the set screws that hold the wheel axles to the struts, screws that hold the carburetor arm (if applicable), screw-lock pushrod connectors, etc.
- 7. Add a drop of oil to the wheel axles.
- 8. Make sure all hinges are **securely** glued in place.
- 9. Reinforce holes for wood screws with thin CA where appropriate (servo mounting screws, cowl mounting screws, etc.).
- 10. Confirm that all controls operate in the correct direction and the throws are set up according to the manual.
- 11. Make sure there are silicone retainers on all the clevises and that all servo arms are secured to the servos with the screws included with your radio.
- 12. Secure connections between servo wires and Y-connectors or servo extensions, and the connection between your battery pack and the on/off switch with vinyl tape, heat shrink tubing or special clips suitable for that purpose.
- 13. Make sure any servo extension cords you may have used do not interfere with other systems (servo arms, pushrods, etc.).
- 14. Secure the pressure tap (if used) to the muffler with high temp RTV silicone, thread locking compound or J.B. Weld.
- 15. Make sure the fuel lines are connected and not kinked.
- 16. Balance your propeller (and spare propellers).
- 17. Tighten the propeller nut and spinner.
- 18. Place your name, address, AMA number and telephone number on or inside your model.
- 19. Cycle your receiver battery pack (if necessary) and make sure it is fully charged.
- 20. If you wish to photograph your model, do so before your first flight.
- 21. Range check your radio when you get to the flying field.
- 22. Make sure all wing attachment bolts and screws are securely tightened.

FLYING

Fuel Mixture Adjustments

A fully cowled engine may run at a higher temperature than an un-cowled engine. For this reason, the fuel mixture should be richened so the engine runs at about 200 rpm below peak speed. By running the engine slightly rich, you will help prevent dead-stick landings caused by overheating.

CAUTION (THIS APPLIES TO ALL R/C AIRPLANES): If, while flying, you notice an alarming or unusual sound such as a low-pitched “buzz,” this may indicate control surface *flutter*. Flutter occurs when a control surface (such as an aileron or elevator) or a flying surface (such as a wing or stab) rapidly vibrates up and down (thus causing the noise). In extreme cases, if not detected immediately, flutter can actually cause the control surface to detach or the flying surface to fail, thus causing loss of control followed by an impending crash. The best thing to do when flutter is detected is to slow the model **immediately** by reducing power, then land as soon as safely possible. Identify which surface fluttered (so the problem may be resolved) by checking all the servo grommets for deterioration or signs of vibration. Make certain all pushrod linkages are secure and free of play. If it fluttered once, under similar circumstances it will probably flutter again unless the problem is fixed. Some things which can cause flutter are; Excessive hinge gap; Not mounting control horns solidly; Poor fit of clevis pin in horn; Side-play of wire pushrods caused by large bends; Excessive free play in servo gears; Insecure servo mounting; and one of the most prevalent causes of flutter; Flying an over-powered model at excessive speeds.

Take Off

Before you get ready to take off, see how the model handles on the ground by doing a few practice runs at **low speeds** on the runway. Hold “up” elevator to keep the tail wheel on the ground. If necessary, adjust the tail wheel so the model will roll straight down the runway. If you need to calm your nerves before the maiden flight, shut the engine down and bring the model back into the pits. Top off the fuel, then check all fasteners and control linkages for peace of mind.

Remember to take off into the wind. When you're ready, point the model straight down the runway, hold a bit of up elevator to keep the tail on the ground to maintain tail wheel steering, and then gradually advance the throttle. As the

model gains speed, decrease up elevator allowing the tail to come off the ground. One of the most important things to remember with a tail dragger is to always be ready to apply **right** rudder to counteract engine torque. Gain as much speed as your runway and flying site will practically allow before gently applying up elevator, lifting the model into the air. At this moment it is likely that you will need to apply more right rudder to counteract engine torque. Be smooth on the elevator stick, allowing the model to establish a **gentle** climb to a safe altitude before turning into the traffic pattern.

Flight

For reassurance and to keep an eye on other traffic, it is a good idea to have an assistant on the flight line with you. Tell him to remind you to throttle back once the plane gets to a comfortable altitude. While full throttle is usually desirable for take off, most models fly more smoothly at reduced speeds.

Take it easy with the Super Stearman for the first few flights, gradually getting acquainted with it as you gain confidence. Adjust the trims to maintain straight and level flight. After flying around for a while, and while still at a safe altitude with plenty of fuel, practice slow flight and execute practice landing approaches by reducing the throttle to see how the model handles at slower speeds. Add power to see how she climbs as well. Continue to fly around, executing various maneuvers and making mental notes (or having your assistant write them down) of what trim or C.G. changes may be required to fine tune the model so it flies the way you like. Mind your fuel level, but use this first flight to become familiar with your model before landing.

Landing

To initiate a landing approach, lower the throttle while on the downwind leg. Allow the nose of the model to pitch downward to gradually bleed off altitude. Continue to lose altitude, but maintain airspeed by keeping the nose down as you turn onto the crosswind leg. Make your final turn toward the runway (into the wind) keeping the nose down to maintain airspeed and control. Level the attitude when the model reaches the runway threshold, modulating the throttle as necessary to maintain your glide path and airspeed. If you are going to overshoot, smoothly advance the throttle (always ready on the right rudder to counteract torque) and climb out to make another attempt. When you're ready to make your landing flare and the model is a foot or so off the deck, smoothly increase up elevator until it gently touches down. Once the model is on the runway and has lost flying speed, hold up elevator to place the tail on the ground, regaining tail wheel control.

One final note about flying your model. Have a goal or flight plan in mind for **every** flight. This can be learning a new maneuver(s), improving a maneuver(s) you already know, or

learning how the model behaves in certain conditions (such as on high or low rates). This is not necessarily to improve your skills (*though it is never a bad idea!*), but more importantly so you do not surprise yourself by impulsively attempting a maneuver and suddenly finding that you've run out of time, altitude or airspeed. Every maneuver should be deliberate, not impulsive. For example, if you're going to do a loop, check your altitude, mind the wind direction (anticipating rudder corrections that will be required to maintain heading), remember to throttle back at the top, and make certain you are on the desired rates (high/low rates). A flight plan greatly reduces the chances of crashing your model just because of poor planning and impulsive moves. **Remember to think.**

Have a ball! But always stay in control and fly in a safe manner.

GOOD LUCK AND GREAT FLYING!