

SUKHOI SU31™

.50 - .91 ARF

ASSEMBLY INSTRUCTIONS



Wingspan: 61 in [1550mm]
Wing Area: 708 sq in [45.7 dm²]
Weight: 7.5 - 8.5 lb [3400 - 3850g]
Wing Loading: 24 - 28oz/sq ft [73 - 85 g/dm²]
Length: 51.5 in [1310mm]
Radio: Four-channel with 5 servos
Engine: .50 - .75 cu in [8 - 12cc] two-stroke,
.70 - .91 cu in [11.5 - 15cc] four-stroke



WARRANTY

Hobbico® 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 Hobbico's liability exceed the original cost of the purchased kit.** Further, Hobbico reserves the right to change or modify this warranty without notice.

In that Hobbico 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.



1610 Interstate Drive
Champaign, Illinois
(217) 398-8970 ext. 2
airsupport@hobbico.com

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TECHNICAL UPDATES

For the latest technical updates or manual corrections to the Hobbico Sukhoi SU31 visit the Hobbico web site at www.hobbico.com. Open the "Airplanes" link, then select the Hobbico Sukhoi SU31 .50 -.91 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.

AMA

We urge you to join the AMA (Academy of Model Aeronautics) and a local R/C club. The AMA is the governing body of model aviation and membership is required to fly at AMA clubs. Though joining the AMA provides many benefits, one of the primary reasons to join is liability protection. Coverage is not limited to flying at contests or on the club field. It even applies to flying at public demonstrations and air shows. Failure to comply with the Safety Code (excerpts printed in the back of the manual) may endanger insurance coverage. Additionally, training programs and instructors are available at AMA club sites to help you get started the right way. There are over 2,500 AMA chartered clubs across the country. Contact the AMA at the address or toll-free phone number below:



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>

IMPORTANT!!!

Two of the most important things you can do to preserve the radio controlled aircraft hobby are to avoid flying near full-scale aircraft and avoid flying near or over groups of people.

Protect your model, yourself & others... Follow these Important Safety Precautions

1. Your Hobbico Sukhoi SU31 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 Hobbico Sukhoi SU31, 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 an experienced pilot or 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.

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

9. **WARNING:** The cowl included in this kit is made of fiberglass, the fibers of which may cause eye, skin and respiratory tract irritation. Never blow into the 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.

We, as the kit manufacturer, provide you with a top quality, thoroughly tested kit and instructions, but ultimately the quality and flyability 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.

HARDWARE & ACCESSORIES

This is a partial list of items required to finish the Hobbico Sukhoi SU31 that may require planning or decision making before starting to build. Order numbers are provided in parentheses.

RADIO EQUIPMENT

- Four channel radio
- Four 54 oz-in servos and one 30 oz-in servo
- Two 6" [150mm] servo extensions (HCAM2701 for Futaba)
- Y-harness (HCAM2751 for Futaba)
- 500 mAh battery or greater

ENGINE RECOMMENDATIONS

We have installed both a two-and a four-stroke engine in our prototypes. The two-stroke engine with a standard muffler or with most Pitts style mufflers requires much of the cowl to be cut away, while the four-stroke maintains most of the integrity of the cowl. If a more "scale" look is desired we recommend the four-stroke engine over the two-stroke.

50 - .75 cu in [8 - 12cc] two-stroke,
.70 - .91 [11.5 - 15cc] four-stroke

ADDITIONAL ITEMS REQUIRED

- R/C foam rubber (1/4" [6mm] - HCAQ1000, or 1/2" [13mm] - HCAQ1050)
- 1/2 oz. [15g] Thin Pro™ CA (GPMR6001)
- 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], 1/8" [3.2mm], 3/16" [4.8mm].
- #1 Hobby knife (HCAR0105)
- #11 blades (5-pack, HCAR0211)
- Top Flite® MonoKote® sealing iron (TOPR2100)
- CA applicator tips (HCAR3780)
- R/C-56 canopy glue (JOZR5007)
- Threadlocker thread locking cement (GPMR6060)

OPTIONAL SUPPLIES AND TOOLS

Here is a list of optional tools mentioned in the manual that will help you build the Hobbico Sukhoi SU31.

- 2 oz. [57g] spray CA activator (GPMR6035)
- CA debonder (GPMR6039)
- Epoxy brushes (6, GPMR8060)
- Mixing sticks (50, GPMR8055)
- Mixing cups (GPMR8056)
- Curved-tip canopy scissors for trimming plastic parts (HCAR0667)
- Robart Super Stand II (ROBP1402)
- 18" x 24" [460 x 610mm] Builder's Cutting Mat (HCAR0455)
- Hobbico Duster™ can of compressed air (HCAR5500)
- Masking tape (TOPR8018)
- Denatured alcohol (for epoxy clean up)
- Switch & Charge Jack Mounting Set (GPMM1000)
- Rotary tool such as Dremel®
- Rotary tool reinforced cut-off wheel (GPMR8200)
- Servo horn drill (HCAR0698)
- AccuThrow™ Deflection Gauge (GPMR2405)
- CG Machine™ (GPMR2400)
- Precision Magnetic Prop Balancer™ (TOPQ5700)

IMPORTANT BUILDING NOTES

- 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 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.hobbico.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

To convert inches to millimeters,
multiply inches by 25.4 (25.4mm = 1")

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	

COMMON ABBREVIATIONS

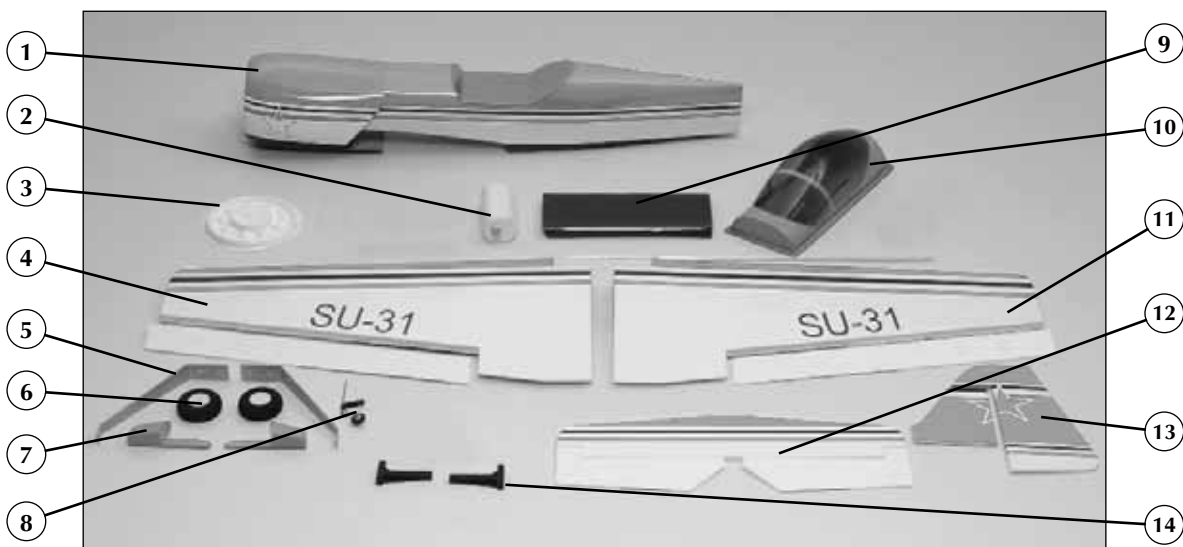
Fuse = Fuselage
Stab = Horizontal Stabilizer
Fin = Vertical Fin
LE = Leading Edge
TE = Trailing Edge
LG = Landing Gear
Ply = Plywood
" = Inches
mm = Millimeters
SHCS = Socket Head Cap Screw

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.

Hobbico Product Support • 3002 N Apollo Drive, Suite 1 • Champaign, IL 61822
Telephone: (217) 398-8970, ext. 2 • Fax: (217) 398-7721
E-mail: aircsupport@hobbico.com

KIT CONTENTS



Parts not photographed

Items photographed

1. Fuselage & Cowl
2. Fuel tank
3. Dummy engine
4. Left wing
5. Landing gear
6. Wheels
7. Wheel pants
8. Tail wheel assembly
9. Belly pan
10. Canopy
11. Right wing
12. Stab & elevators
13. Fin & Rudder
14. Engine Mount

Qty

- 2 15x15x15mm hardwood block
- 2 15x15x10mm hardwood block
- 2 155mm length of Velcro®
- 2 3mm plywood wing joiner
- 1 Plywood wing bolt plate
- 5 Nylon control horns and plates
- 17 Hinges
- 5 Nylon clevises
- 4 Faslinks
- 2 4 x 40mm machine screw
- 2 4 x 35mm machine screw
- 4 4 x 25mm machine screw
- 4 4 x 19mm machine screw
- 4 4 x 15mm machine screw
- 10 4mm flat washer
- 8 4mm lock washers
- 2 4mm nuts
- 3 3 x 5mm machine screw
- 2 4mm wheel collar
- 4 2 x 20mm machine screw

Qty

- 6 2 x 15mm machine screw
- 3 2 x 7mm sheet metal screw
- 1 screw lock connector
- 1 2mm thumb nut
- 1 2mm washer for screw-lock connector
- 1 300mm nylon pushrod
- 3 2 x 710 mm pushrod wire
- 1 1mm wire
- 4 4mm blind nuts
- 4 3 x 12mm cowl mounting bolts
- 1 6 x 6 x 127mm balsa stick
- 1 2.5" (approximately 64mm) red plastic spinner
- 1 400mm fuel tubing
- 6 4mm lock nuts
- 5 Silicone clevis retainers
- 2 2 x 80mm pushrod wire

ORDERING REPLACEMENT PARTS

Replacement parts for the Sukhoi SU 31 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.

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.

Parts may also be ordered directly from Hobby Services by calling (217) 398-0007, or via facsimile at (217) 398-7721, but full retail prices and shipping and handling charges will apply. Illinois and Nevada residents will also be charged sales tax. 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 Product Support by e-mail at productsupport@hobbico.com, or by telephone at (217) 398-8970.

REPLACEMENT PARTS LIST

Order Number	Description	How to purchase
HCAA3630	Wing	Hobby Supplier
HCAA3631	Fuse/belly pan	Hobby Supplier
HCAA3633	Tail Surfaces	Hobby Supplier
HCAA3632	Cowl	Hobby Supplier
HCAA3635	Canopy	Hobby Supplier
HCAA3636	Landing Gear	Hobby Supplier
HCAA3634	Wheel Fairings	Hobby Supplier
HCAA3637	Dummy Engine	Hobby Supplier
Missing pieces		Product Support
Instruction manual		Product Support
Full-size plans		Not available

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. Remove the tape and separate the ailerons and flaps from the wing and the elevators from the stab. Use a covering iron with a covering sock on high heat to tighten the covering if necessary. Apply pressure over sheeted areas to **thoroughly** bond the covering to the wood.



When ready to fly, you'll need some additional equipment to fuel the plane and start the engine. The most important items include an electric starter, 12 volt battery, or chicken stick, fuel pump (electric or hand-crank), fueling lines and fittings and a 1.5 volt glow plug igniter. Your flight instructor will probably let you share his equipment for a while, but eventually you'll need your own. Visit your local hobby dealer or see the Hobbico catalog for a full selection, descriptions and pricing.

ASSEMBLE THE WING

INSTALL THE AILERONS

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



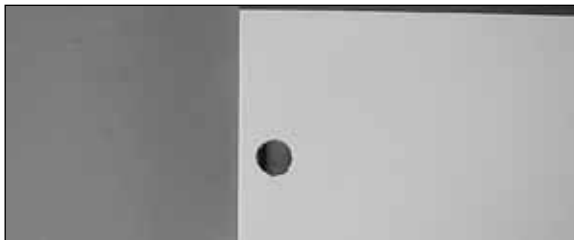
- 1. Install a hinge into each of the four hinge slots in the aileron. Be sure the slit in the hinge is perpendicular to the leading edge of the aileron.



- 2. Apply six drops of thin CA to the top and bottom of each hinge waiting a few seconds between drops to allow the CA to soak in. Do not use CA accelerator. After the CA has fully hardened, test the hinges by pulling on the aileron.



- 3. Locate the opening for the servo on the bottom of the wing. Cut the covering from the opening.



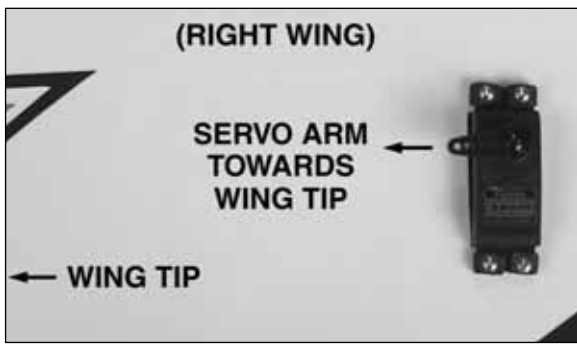
- 4. On the top of the wing locate the 1/2" [13mm] hole and cut the covering away.
- 5. Repeat steps 1 - 4 for the left wing.

INSTALL THE AILERON SERVOS AND PUSHRODS

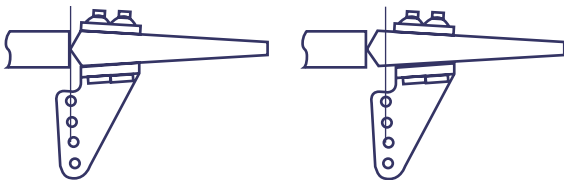
- 1. Installing the servos in the wing will require the use of one 6" [152mm] servo extension for each aileron. One Y-harness connector is required and is used to allow the aileron servos to plug into one slot in your receiver. You may have a computer radio that allows you to plug the servos into separate slots and mix them together through the radio transmitter. If you choose to mix them with the radio rather than the Y-harness, refer to the instructions with your particular brand of radio. Attach the servo extension to the aileron servo. Secure the connectors together using a large piece of heat shrink tubing or tape.



- 2. Located in the wing in the servo compartment, a string is taped to the wing skin. Tie the string to the end of the servo wire. Pull the servo wire through the wing with the string. Feed the servo wire out the hole in the top of the wing center section. Tape the servo wire to the wing to prevent it from falling back into the wing.

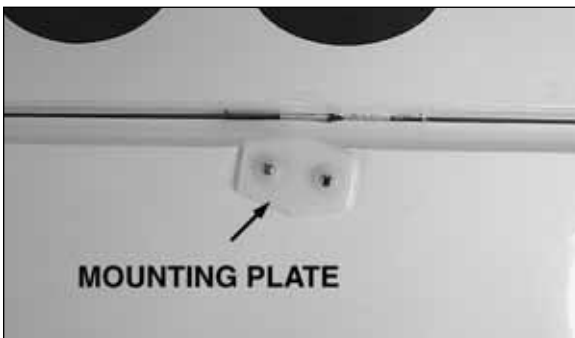


3. Install the servo into the wing. Center the servo and install a servo arm as shown.



Correct

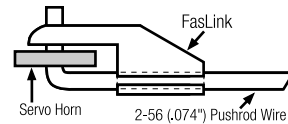
Incorrect



4. Position a nylon control horn on the aileron as shown in the sketch, aligning it with the servo. Mark the location for the screw holes. Drill through the marks you made with a 1/16" [1.6mm] drill bit, drilling through the aileron. Secure the control horn to the aileron with two 2 x 20mm [3/4"] machine screws and the nylon mounting plate.

5. Locate a 2 x 102mm [4"] pushrod wire threaded on one end. Screw a nylon clevis onto the threaded end of the wire 20 full turns. Install a silicone clevis keeper onto the clevis and then install the clevis in the second hole from the end of the aileron control horn.

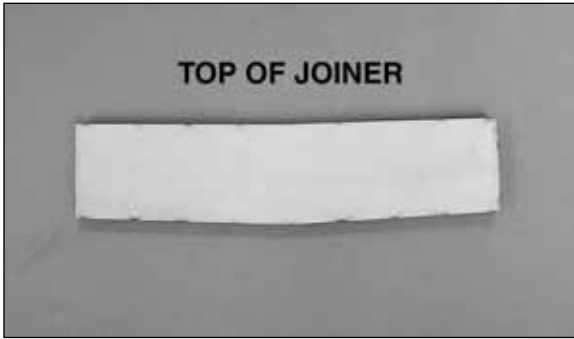
6. Be sure the aileron servo is centered. Enlarge the second outermost hole in the servo arm with a Hobbico Servo Horn Drill (or a #48 or 5/64" [2mm] drill bit). Center the aileron and align the wire pushrod with the hole in the end of the servo arm. Using a marker, mark the location where the wire aligns with the hole in the servo arm. On that mark make a 90 degree bend. From the bend measure an additional 3/16" [4.8mm], then cut off the excess pushrod wire.



7. Install the wire into the hole in the servo arm using a nylon FasLink as shown in the sketch.

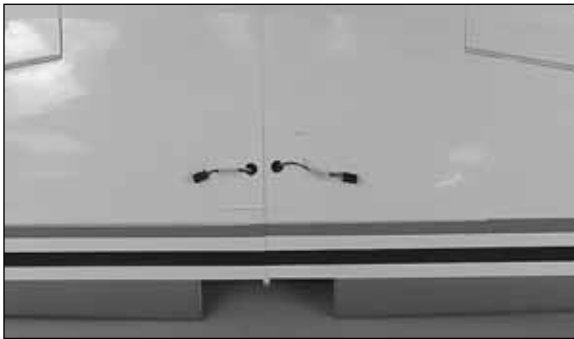
8. Repeat steps 1 - 7 for the left wing panel.

JOIN THE WINGS



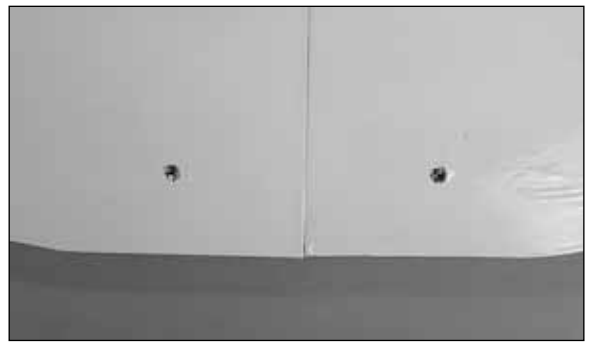
❑ 1. Locate two hardwood **wing joiners**. Glue them together with 6-minute epoxy, forming one 1/4" [6mm] wing joiner. Set the joiner aside until the glue cures.

❑ 2. Test fit the joiner into both wing halves, making sure that it is not too tight. Sand the joiner as needed to get a good fit.

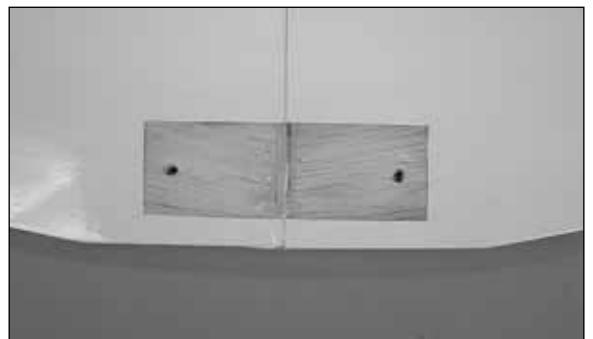
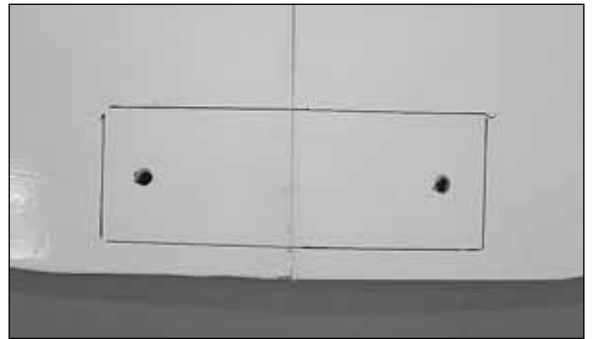
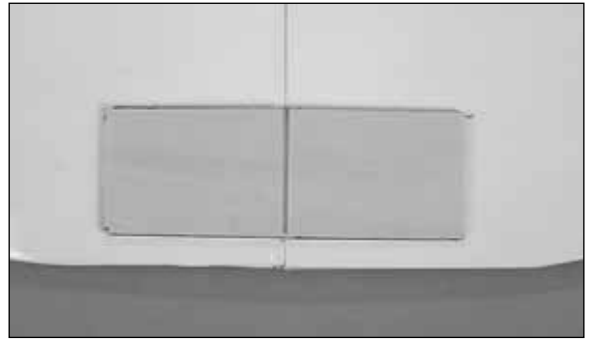


❑ 2. Apply 30-minute epoxy to the wing joiner, the joiner pocket in both wing panels and the root rib of each wing panel. Push the wing panels together and hold them in place with masking tape. Before the glue cures, set the wing flat on your bench and measure the dihedral. The distance from the top of the bench to the center of the wing as measured at the wing tip should be approximately 2-3/8" [60mm]. Block the wingtip up while the glue cures. **Note:** Due to production techniques there may be some variance in the actual dihedral of each model. 1/4" [6mm] more or less than this dimension is acceptable.

❑ 3. Set the wing aside allowing the glue to cure.



❑ 4. Cut the covering from the wing bolt holes on both the top and bottom of the wing.



❑ 5. Place the plywood **wing bolt mounting plate** in position on the bottom of the wing, centered on the wing bolt holes. Using a fine-tip, felt-tip marker, trace the outline of the plate onto the wing. Use a sharp #11 hobby knife or use the **Expert Tip** that follows to cut the covering from the wing along the lines you have marked. Use care to cut **only into the covering** and **not** into the wood.

Hot Tip

How to cut covering from balsa



Use a soldering iron to cut the covering from the stab. 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.

- ❑ 6. Glue the plywood wing bolt plate to the wing.



- ❑ 7. From the top of the wing, drill through the two wing bolt holes and through the plywood wing bolt plate using a 5/32" [4mm] drill bit.

- ❑ 8. Mount the wing to the fuselage with two 4 x 35mm [1-3/8"] machine screws and two 4mm washers.



- ❑ 9. Cut the covering from the wing bolt holes in the **belly pan**. Place the belly pan onto the bottom of the wing, aligning it with the fuselage. Mark the outline of the belly pan onto the fuselage with a fine-tip, felt-tip marker.



- ❑ 10. Just inside the lines you have made, cut away a 1/4" [6mm] strip of covering. Remove a 1/4" [6mm] strip from the front and rear of the wing as well.

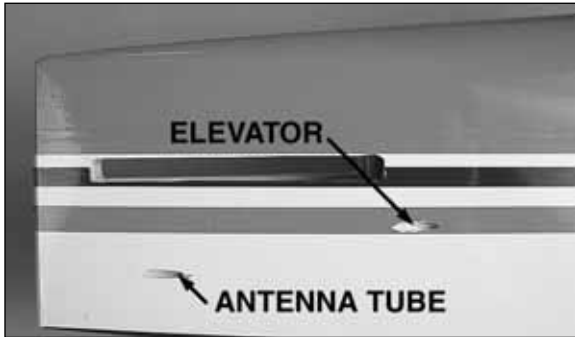
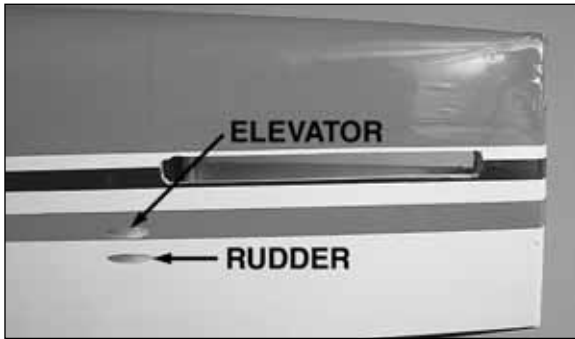


- ❑ 11. Glue the belly pan to the wing. Tape the belly pan in place while the glue cures. Once cured, remove the wing from the fuselage.

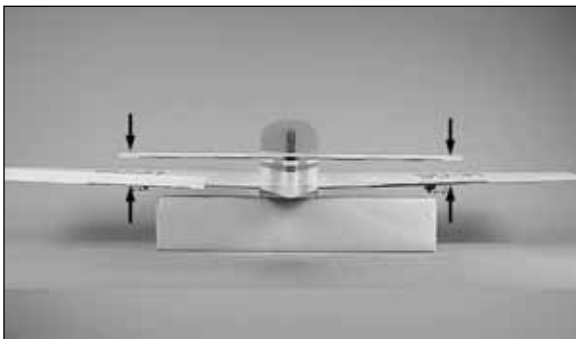
- ❑ 12. If you will be using a "Y" harness for the ailerons, attach the "Y" harness to the aileron servos. Secure the connectors together using a large piece of heat shrink tubing, tape or other method.

ASSEMBLE THE FUSELAGE

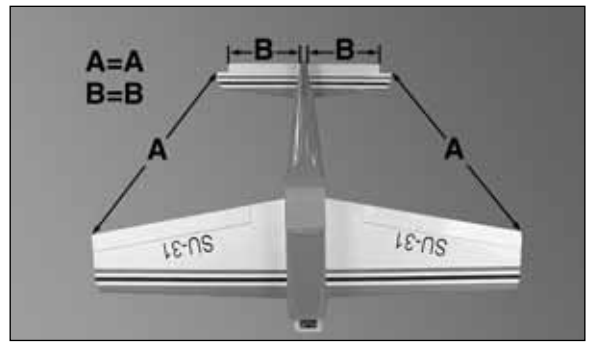
INSTALL THE STAB, ELEVATORS AND RUDDER



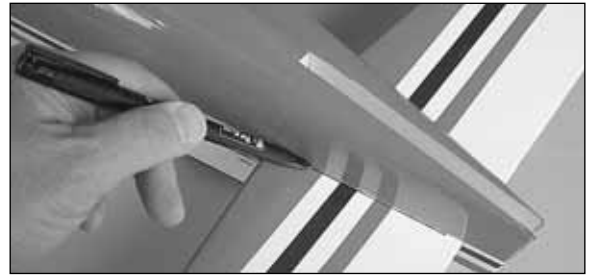
- ❑ 1. Cut the covering away from the stab opening on both sides of the fuselage. On the left side of the fuselage cut away the covering from the elevator and rudder pushrod openings. On the right side cut the covering from the elevator and antenna openings.



- ❑ 2. Mount the wing to the fuselage to test fit the **stab** into the opening in the back of 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 align.



- ❑ 3. Measure the distance from the tip of the stab to the tip of each wing. Adjust the position of the stab until both are equal.



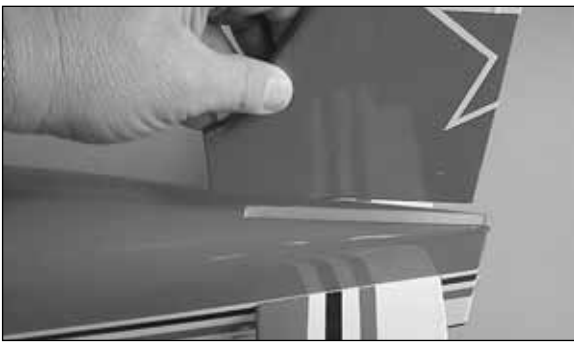
- ❑ 4. Once you are satisfied with the fit and positioning of the stab, use a fine, felt-tip marker and trace the outline of the fuselage onto the top and bottom of the stab. Cut the center section of the covering from the top and bottom of the wing using the same technique used for the wing.

- ❑ 5. When satisfied with the fit of the stab, use thin CA with a CA applicator tip to wick glue into the stab saddle. Apply the glue to the top, bottom and both sides of the fuselage. Allow the glue to fully cure before moving. After the glue has cured remove the wing from the fuselage.

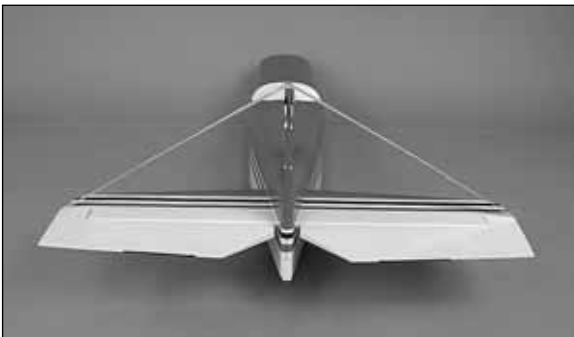
"Hint": Do not use any accelerator. This will most likely cause the glue to get a white haze on the fuselage and stab. Allow the plane to sit for approximately 5 minutes until the glue is completely cured.



- ❑ 6. Install the two elevator halves using the same method used for the ailerons. Once you are satisfied with the positioning of the elevators, glue them in place with thin CA the same as was done on the ailerons.



❑ 7. Install the fin into the slot in the top of the fuselage. Use a fine, felt-tip marker and trace the outline of the fuselage onto the fin. Cut the covering from the fin using the same technique used on the wing and stab.

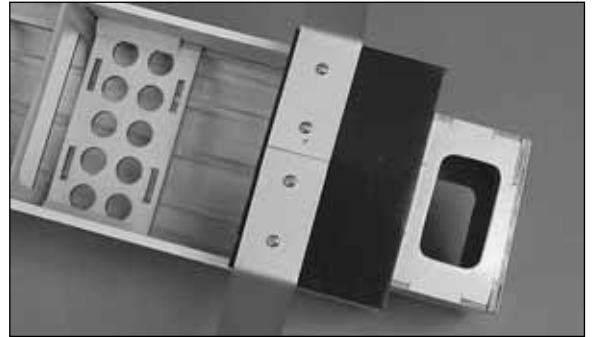


❑ 8. Apply epoxy on the fin and in the slot in the fuselage. Check to make sure the fin is perpendicular to the stab. If necessary, use masking tape to pull the fin into position. Set the fuselage aside until the glue cures.

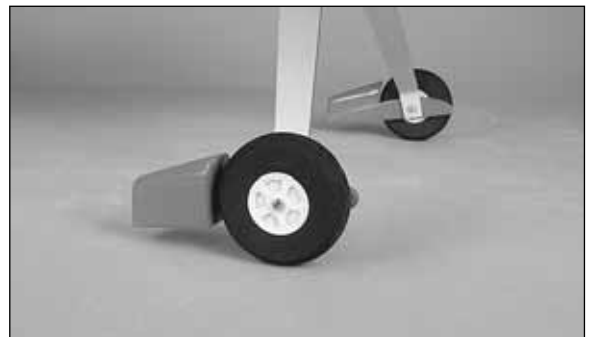
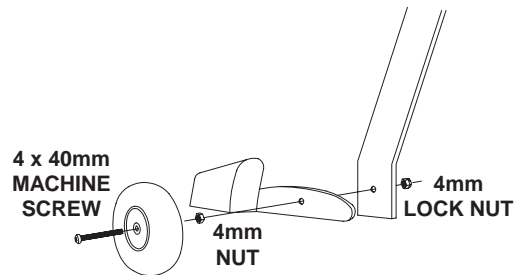
❑ 9. Insert three hinges into the rudder. Then slide the rudder onto the fin. Apply thin CA onto the hinges the same as was done with the other control surfaces.

This completes the installation of the tail surfaces. You will finish the installation of the control horns and pushrods when you do the radio installation.

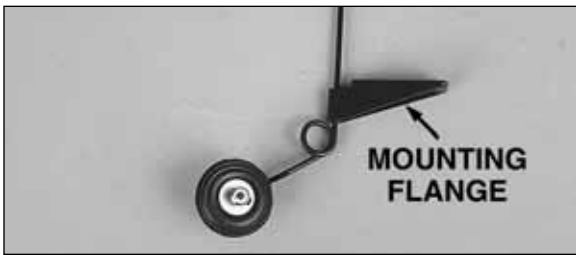
INSTALL THE LANDING GEAR



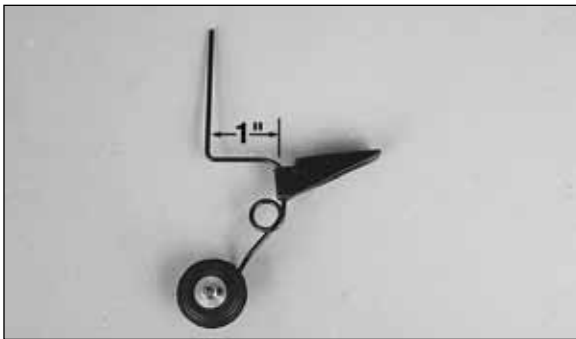
❑ 1. Attach the landing gear to the fuselage with four 4 x 15mm [9/16"] machine screws. Apply a couple of drops of thread locker to the bolts before installing them into the fuselage.



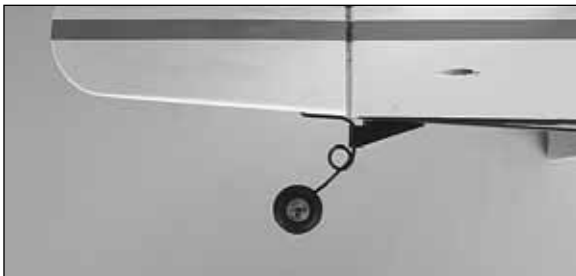
❑ 2. Assemble the wheel and wheel pant as shown. Do this for both wheels.



3. Slide the black nylon mounting flange onto the tail wheel wire. Then bend the wire as shown.



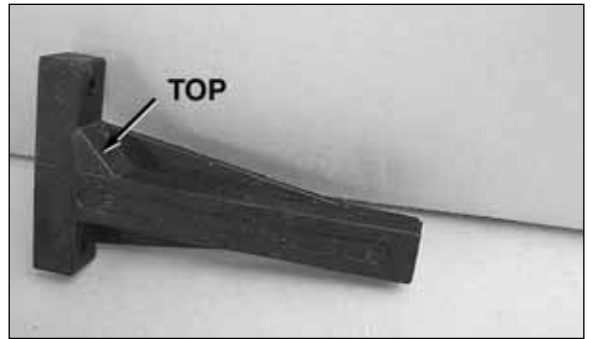
4. Make a 90 degree bend 1" [25mm] from the pivot point of the tail wheel wire.



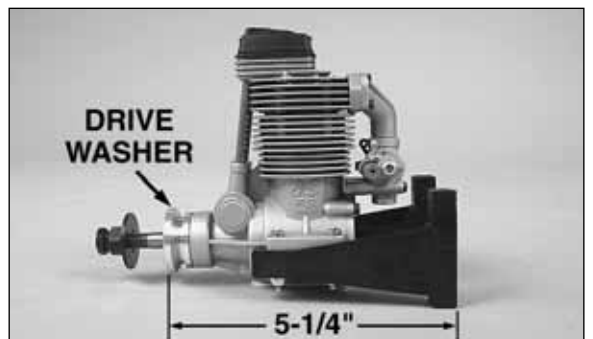
5. Place the tail wheel assembly onto the bottom of the fuselage and mark the location where the wire will go through the rudder. Drill a 1/16" [1.6mm] hole into the bottom of the rudder; slide the wire into the bottom

of the rudder. Drill a 1/16" [1.6mm] hole into the fuselage through each of the mounting holes in the nylon mounting flange. Secure the flange to the fuselage with three 2 x 7mm [5/16"] sheet metal screws.

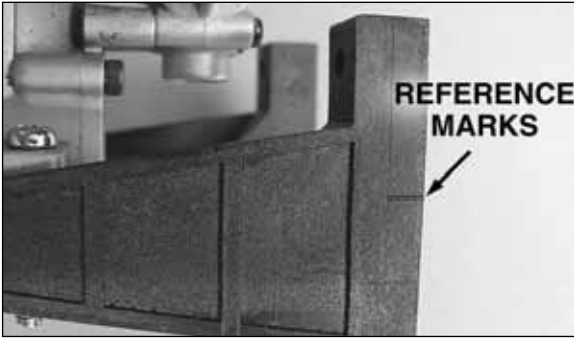
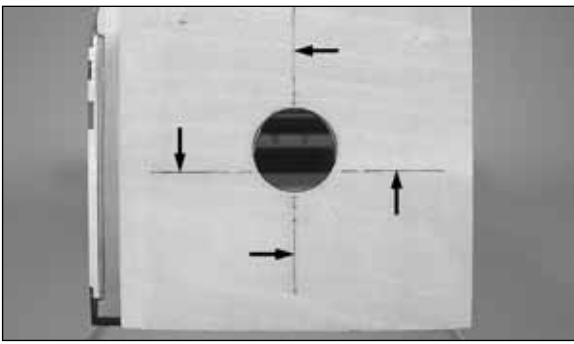
INSTALL ENGINE, FUEL TANK & THROTTLE SERVO



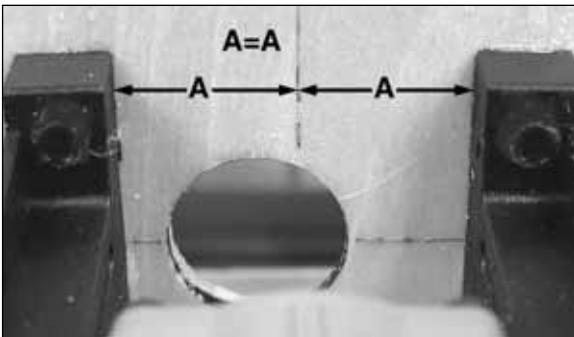
1. The top of the engine mount can be identified by the angled bevel. Be sure when mounting the engine in the following steps that you mount the engine on the top of this rail.



2. Mount the engine to the two engine mount halves. The distance from the front of the engine thrust washer to the firewall should be 5-1/4" [133mm]. Place the engine on one of the mounts. Mark the location for the mounting holes onto the engine mount rail. On the marks, drill through the rail with a 5/32" [4mm] drill. Secure the engine to the rail with 4 x 25mm [1"] machine screws and 4mm lock nuts. Do this for both engine mount halves.



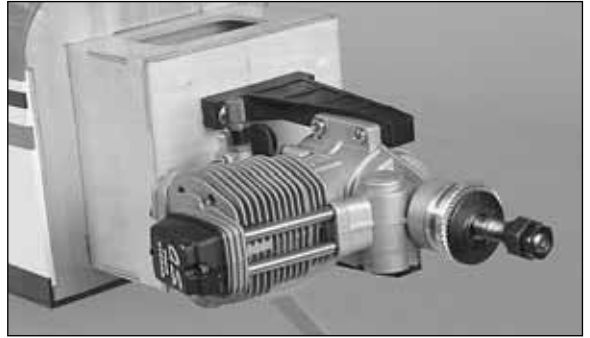
❑ 3. The engine will be mounted to the firewall on its side (see photograph at step 7). On the firewall there are reference marks. On the engine mount there are also reference marks.



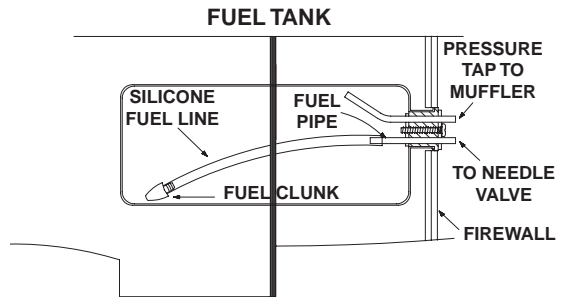
❑ 4. Align the reference marks of the engine mount with the lines on the firewall and center the sides of the engine mount with the reference lines on the firewall.

❑ 5. With the engine properly positioned mark the engine mount holes onto the firewall. Remove the engine from the firewall and drill through each of the marks with a 3/16" [4.8mm] drill.

❑ 6. Position a 4mm blind nut behind one of the holes you drilled in the firewall. Insert a 4mm [5/32"] machine screw and washer into the hole, threading it into the 4mm blind nut. Tighten the bolt until the blind nut is pulled tight against the backside of the firewall. Remove the bolt and repeat this for each of the three remaining holes.



❑ 7. Install the engine mount to the firewall with four 4 x 19mm [3/4"] machine screws, 4mm lock washer and 4mm flat washer.

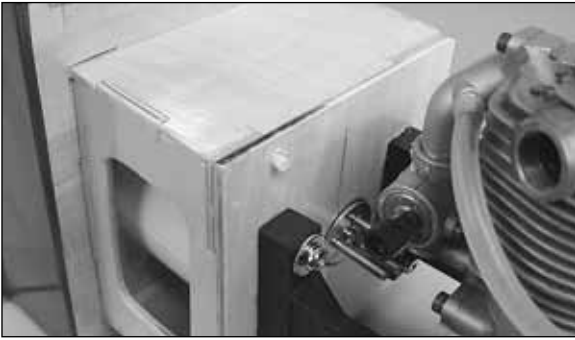


❑ 8. Assemble the **fuel tank** as shown. If you will be using a fuel valve (not included) for filling the tank rather than filling the tank by removing the line from the carburetor, install it in the fuel line following the instructions included with the valve.

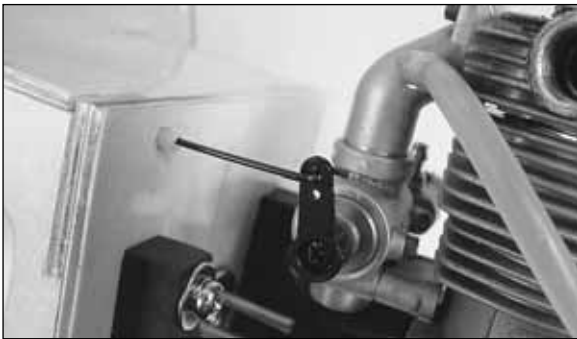


❑ 9. Install the fuel tank into the fuselage, and through the hole in the firewall. From the 6 x 6 x 127mm [5"] balsa stick, cut the stick to fit and glue it in place behind the tank.

- ❑ 10. Install fuel tubing from the tank to the engine and muffler, following the instructions with your engine.

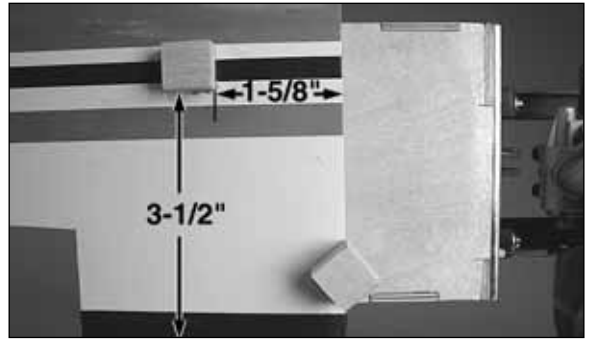


- ❑ 11. Drill a 5/64" [2mm] hole through the firewall in line with the carburetor on your engine. Insert the 2 x 300mm [12"] nylon throttle tube guide through the hole and into the radio compartment. Apply glue to the end of the nylon pushrod, gluing it to the firewall.



- ❑ 12. Mount the throttle servo on the left side of the servo tray as shown. (Refer to the picture on page 18, "Install the Radio System", step 7 for the placement of all of the servos in the fuselage). Install the screw-lock connector onto the servo arm, securing it with a 2mm washer and nut. Apply a drop of thread locker to the nut to prevent it from coming loose. Slide the 1mm pushrod wire into the tube and through the hole in the screw-lock connector. Install the throttle arm onto the z-bend on the end of the pushrod wire. When the pushrod wire is secure on the throttle arm, secure the throttle wire to the screw-lock connector with a 2 x 2mm [1/16"] bolt.

MOUNT THE COWL



- ❑ 1. On the right side of the fuselage, mark the location for the cowl mounting blocks. For the top mounting block measure from the front of the fuselage back 1-5/8" [40mm] and make a line. Measure up from the bottom of the fuselage 3-1/2" [89mm] and make a line intersecting the other line. Place a 15 x 15 x 10mm [5/8" x 5/8" x 3/8"] hardwood block at the intersection of the two lines. Trace the outline of the block onto the fuselage. At the location of the block, cut the covering from the fuselage.

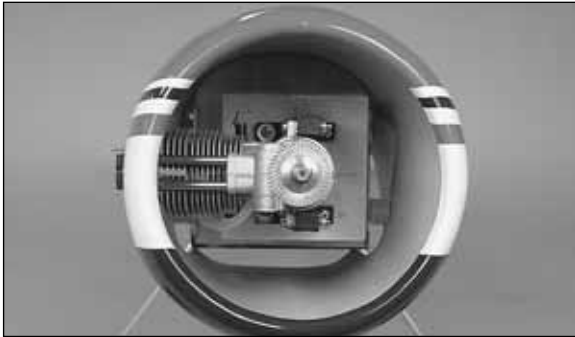
At the front of the fuselage, measure up from the bottom of the fuselage 3/4" [19mm] and make a mark. Place a 15 x 15 x 15mm [5/8" x 5/8" x 5/8"] block on this line, turning the block so the corners are aligned with the front of the fuselage. Trace the outline of the block and then cut the covering from the fuselage. Glue both blocks to the fuselage with 6-minute epoxy. Repeat this procedure for the blocks on the left side of the fuselage.

- ❑ 2. Next you need to slip the **cowl** onto the fuselage. Depending on which engine you have chosen to install, you may not be able to slide the cowl over the engine. Most 2-stroke engines are short enough to allow the cowl to slip over the engine without interference. The O.S.[®] .91 is a bit too tall for the cowl to slide over but will fit if you remove the valve cover.



- ❑ 3. For the next step you may find it helpful to have an assistant. Position the cowl so the distance from

the firewall to the front of the cowl is 5-3/8" [136mm]. This dimension will properly space the engine when using the spinner included with this kit. If you are using a different spinner or no spinner you may need to position the cowl further forward or back to properly position the cowl. Place your spinner and propeller on the engine to be sure you have the proper spacing required.



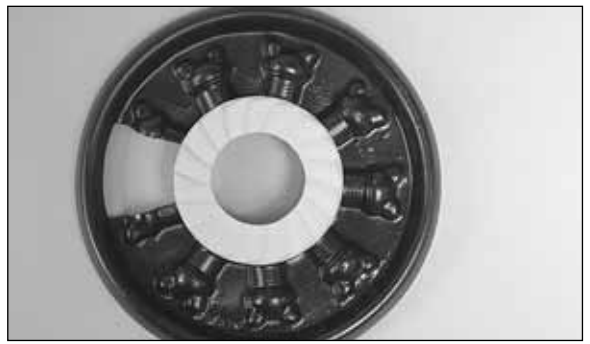
❑ 4. Double-check to be sure you have the proper spacing for the cowl and that the cowl is centered on the engine. Have your assistant hold the cowl while you mark the location for the cowl mounting screws. (The cowl mounting blocks are easily visible from the back of the cowl.)

Begin on the right side of the fuselage first. Drill a 3/32" [2.4mm] hole through the cowl and into the top cowl mounting block. Install a 3mm cowl mounting screw into the cowl. Double check the positioning of the cowl and then drill the bottom hole. Repeat this for the left side of the fuselage, checking the position of the cowl after each screw is installed.

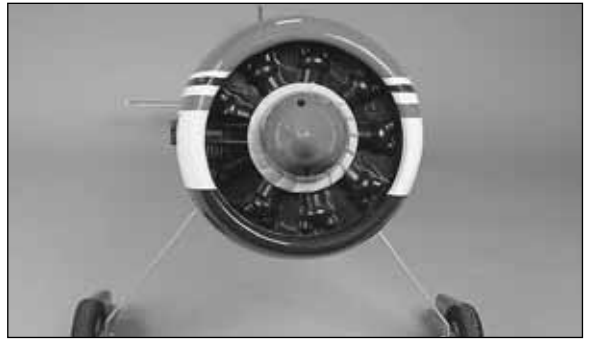
❑ 5. Remove the cowl mounting screws and the cowl. Put a couple of drops of thin CA into each of the screw holes to harden the threads. Allow the glue to cure.



❑ 6. Re-install the cowl onto the front of the fuselage. On the cowl, mark the location for the glow plug, needle valve, muffler or any part of the engine that conflicts with the cowl. Using a rotary tool, begin cutting small portions of the cowl, making the holes progressively larger until the cut-out matches your particular engine installation.



❑ 7. Cut the center of the plastic **dummy engine** to fit around the front of the engine. Leave plenty of clearance between the dummy engine and the engine thrust washer. The spinner will cover any gaps between the two. Mark the location of the engine cylinder and then cut away this area from the dummy engine. Paint the dummy engine with a fuel proof paint. We painted the louvers a light gray and the engine flat black.



❑ 8. Slip the dummy engine into the cowl and then install the cowl onto the fuselage. Position the dummy engine, centering it with the engine. Using medium CA glue with a micro-tip on the bottle, tack glue the dummy engine to the cowl. Once the dummy engine is secure to the cowl, remove the cowl and permanently glue the dummy engine in place by applying a bead of glue to the back of the dummy engine from inside the cowl.

INSTALL THE RADIO SYSTEM

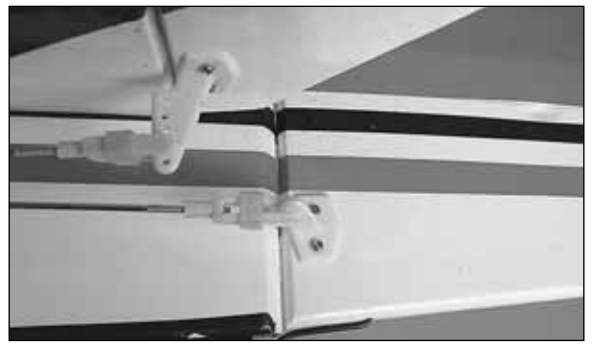
1. Locate three 2 x 685mm [27"] pushrod wires threaded on one end. Screw a nylon clevis onto the threaded end of the wires 20 full turns. Install a silicone clevis keeper onto the clevises. Connect a nylon control horn onto each of the two clevises. Install the clevis in the second hole from the end of the control horn.



2. Slide two of the wires with clevises attached into the openings shown in the photographs.



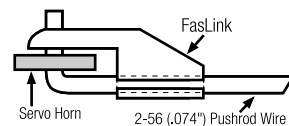
3. Position the control horns on the elevators, positioning them the same way as you did with the ailerons. Mark the location for the screw holes. Drill through the marks you made with a 1/16" [1.6mm] drill bit, drilling through the elevator. Secure the control horn to the aileron with two 2 x 15mm [5/8"] machine screws and the nylon mounting plate.



4. Insert the third rod into the remaining opening on the left side of the fuselage. Connect the control horn to the clevis and attach the control horn to the rudder in the same way you installed them to the elevators.



5. Install the rudder servo into the servo tray at the position shown. Mark the location for the servo mounting screws. Drill a 1/16" [1.6mm] hole through the marks, drilling through the plywood tray. Insert and then remove one of the servo mounting screws supplied with your radio into each of the four holes you have drilled. Apply a couple of drops of thin CA to each of the holes to harden the threads. After the glue has cured permanently mount the servo.

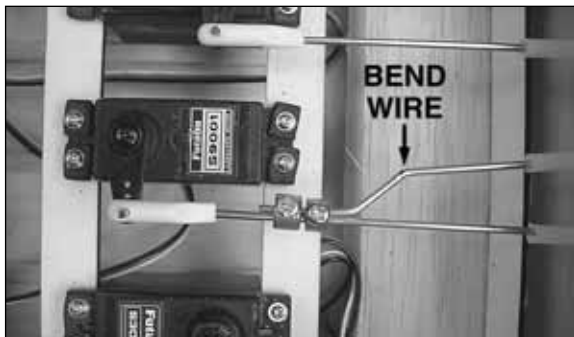


6. Be sure the rudder servo is centered. Enlarge the outermost hole in the servo arm with a Hobbico Servo Horn Drill (or a #48 or 5/64" [2mm] drill bit).

Center the rudder and align the wire pushrod with the hole in the end of the servo arm. Use a fine, felt-tip pen to mark the wire where it crosses the holes in the servo arm. On that mark make a 90 degree bend. From the bend measure an additional 3/16" [4.8mm] and then cut off the excess pushrod wire. Install a nylon Faslink to the wire and servo arm.



7. Install the elevator servo into the servo tray. Position it in line with the elevator pushrods. Mount the servo using the same procedure used for the rudder servo.



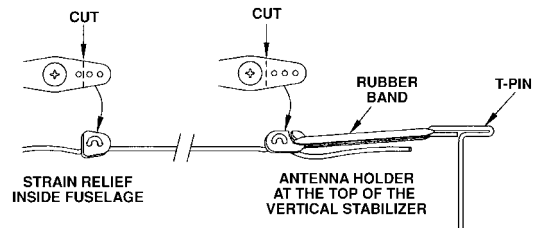
8. Make a bend in the elevator pushrod wires as shown in the photo above.

9. Screw a 2.5 x 5mm [3/16"] bolt with a small amount of threadlocker into two 4mm [5/32"] wheel collars. Slide the wheel collars onto the wires. Align the elevators. Tighten the set screws against the wires. Cut the excess wire.

10. Be sure the elevator servo is centered. Enlarge the outermost hole in the servo arm with a Hobbico Servo Horn Drill (or a #48 or 5/64" [2mm] drill bit). Center the elevators and align the wire pushrod with the hole in the end of the servo arm. Using a marker, mark the location where the wire aligns with the hole in the servo arm. On that mark make a 90 degree bend. From the bend measure an additional 3/16" [4.8mm] and then cut off the excess pushrod wire. Install a nylon Faslink to the wire and servo arm.



11. Install the battery and receiver as shown. Place 1/4" thick foam under the receiver and battery, holding it in place with the Velcro material included with the kit.



12. Use an arm cut from a servo horn to make an antenna strain relief as shown. Insert the receiver antenna into the white antenna tube. Hold it to the fuselage by placing a small rubber band around the tail wheel and the end of the antenna.



13. Install the radio switch to the side of the fuselage. 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.

FINISHING TOUCHES

- ❑ 1. If you wish to install a pilot, permanently glue it in place in the cockpit.



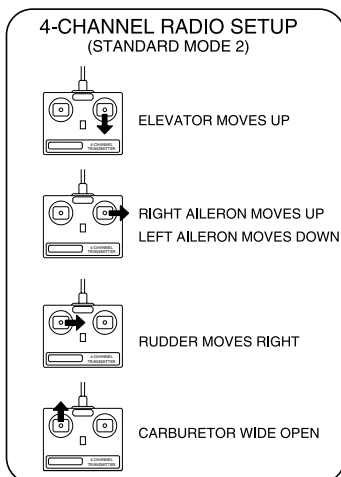
- ❑ 2. Trim the canopy on the molded cut lines. Glue the canopy to the fuselage with RC 56 canopy glue.

- ❑ 3. Install the propeller that is best suited to your engine.

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.



- ❑ 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.

Recommended control surface throws

	High Rate	Low Rate
ELEVATOR	5/8" up [16mm]	1/2" up [13mm]
	5/8" down	1/2" down
RUDDER	1-1/2" right [38mm]	1" right [25mm]
	1-1/2" left	1" left
AILERONS	3/4" up [19mm]	1/2" up [13mm]
	3/4" down	1/2" up

IMPORTANT: The Hobbico Sukhoi SU31 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 Hobbico Sukhoi SU31 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 paint, and the radio system.

❑ 1. Use a felt-tip pen or 1/8" [3mm]-wide tape to accurately mark the C.G. on the top of the wing on both sides of the fuselage. The C.G. is located 3-15/16" [100mm] back from the leading edge of the wing at the fuselage side.

This is where your model should balance for the first flights. Later, you may wish to experiment by shifting the C.G. up to 1/4" [6mm] forward or 1/8" [3mm] 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 takeoff 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, place the model upside-down on a Great Planes CG Machine, or lift it upside-down 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 to balance. If possible, relocate the battery pack and receiver to minimize or eliminate any additional ballast required. If additional weight is required, nose weight may be easily added by using a “spinner weight” (GPMQ4645 for the 1 oz. [28g] weight, or GPMQ4646 for the 2 oz. [56g] weight). If spinner weight is not practical or is not enough, use Great Planes (GPMQ4485) “stick-on” lead. A good place to add stick-on nose weight is to the firewall (don’t attach weight to the cowl—it is not intended to support weight). Begin by placing incrementally increasing amounts of weight on the bottom of the fuse over the firewall until the model balances. Once you have determined the amount of weight required, it can be permanently attached. If required, tail weight may be added by cutting open the bottom of the fuse and gluing it permanently inside.

Note: Do not rely upon the adhesive on the back of the lead weight to permanently hold it in place. Over time, fuel and exhaust residue may soften the adhesive and cause the weight to fall off. Use #2 sheet metal screws, RTV silicone or epoxy to permanently hold the weight in place.

❑ 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 wing 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

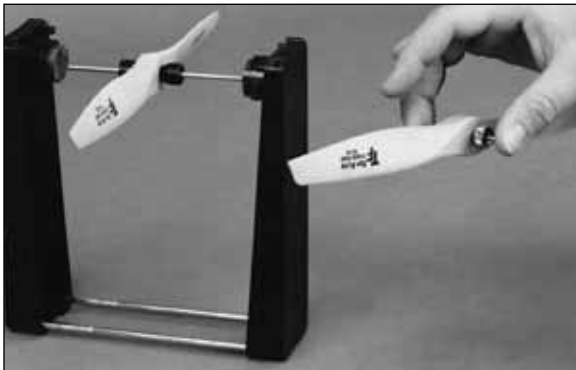
No matter if you fly at an AMA sanctioned R/C club site or if you fly somewhere on your own, you should always have your name, address, telephone number and AMA number on or inside your model. It is **required** at all AMA R/C club flying sites and AMA sanctioned flying events.

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 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 excerpts from the Academy of Model Aeronautics Safety Code. For the complete Safety Code refer to *Model Aviation* magazine, the AMA web site or the Code that came with your AMA license.

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 and avoid flying in the proximity of full-scale aircraft. Where necessary, an observer shall be utilized 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.
- 5) I will not fly my model unless it is identified with my name and address or AMA number, on or in the model. Note: This does not apply to models while being flown indoors.
- 7) 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) At all flying sites a straight or curved line(s) must be established in front of which all flying takes place with the other side for spectators. Only personnel involved with flying the aircraft are allowed at or in the front of the flight line. Intentional flying behind the flight line is prohibited.
- 4) I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission.
- 5) **I will not knowingly operate my model within three miles of any pre-existing flying site except in accordance with the frequency sharing agreement listed** [in the complete AMA Safety Code].
- 9) Under no circumstances may a pilot or other person touch a powered model in flight; **nor should any part of the model other than the landing gear, intentionally touch the ground, except while landing.**

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 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 has a strain relief inside the fuselage to keep tension off the solder joint inside the receiver.
- 5. Balance your model *laterally* as explained in the instructions.
- 6. Use threadlocking compound to secure critical fasteners such as the set screws that hold the wheel axles, screws that hold the carburetor arm (if applicable), screw-lock pushrod connectors, etc.
- 7. Add a drop of oil to the axles so the wheels will turn freely.
- 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 are 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.

FLYING

The Hobbico Sukhoi SU31 is a great-flying model that flies smoothly and predictably. The Hobbico Sukhoi does not, however, possess the self-recovery characteristics of a primary R/C trainer and should be flown only by experienced R/C pilots.

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.

Takeoff

Before you get ready to takeoff, 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 takeoff 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 takeoff, most models fly more smoothly at reduced speeds.

The Sukhoi is capable of virtually all aerobatic maneuvers. Loops, point rolls, knife edge, spins etc. are all within the capabilities of this airplane. For those of you who have the desire to try 3-D maneuvers you will find that the Sukhoi is capable of many of the basic 3D flight maneuvers as well as some of the more advanced ones. Using an engine from the upper end of the engines recommended, will provide you with the best choice for flying 3D.

Take it easy with the Hobbico Sukhoi 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!