SUN DANCER 50

SIG ALMOST READY TO FLY

INTRODUCTION

Congratulations on the purchase of the SIG Sun Dancer 50 ARF kit! Properly assembled, powered, and flown, the Sun Dancer 50 will quickly become one of your favorite models. The construction of this ARF kit has been extremely well engineered, providing an airframe that is both light and strong. Of course, this translates to outstanding flight characteristics when powered with the recommend engine sizes. The Sun Dancer 50 has excellent take-off and landing characteristics, as well as remarkable aerobatic capabilities. The airframe has been carefully designed to provide you with a model that has a true "zeroed out" feel in the air. This characteristic tends to provide a great deal of confidence when performing those wild aerobatic maneuvers.

The engine choice for your Sun Dancer 50 is important. The airplane will fly and fly well on good running .46 ball-bearing engines. As your choice of engines increases in displacement and power, obviously the airplane will respond accordingly. The largest and most powerful engine we have flown in this model is the potent YS .63 four-stroke. This engine, swinging an APC 12 X 6, provides the Sun Dancer 50 with an outrageous amount of power, making it definitely a "throttle management" type model. We do not recommend engines any larger or more powerful than the YS .63 for this model - it simply is not necessary.

We highly recommend that you follow the following assembly instructions carefully. We also suggest that you take the time to inventory the contents of your kit, using the included parts information. Finally, the Sun Dancer 50 ARF is not recommended for beginning R/C pilots. If this is your first R/C model, we urge you to seek and use experienced help in both assembling and flying this airplane.

Engine Note: Due to the large number of useable engines for this model, we simply cannot cover every possible engine installation. However, the large volume of space provided inside the cowling should make it easy to mount virtually any engine within the suggested size range.

RADIO EQUIPMENT:

We highly recommend the use of a modern computer radio for this model. Such radio systems allow you to easily set-up and adjust each channel and in addition, pre-program flight control functions to suit your individual flying style. Four channels are required to fly your Sun Dancer 50 - rudder, elevator, ailerons, and throttle.

The Sun Dancer 50 requires a total of five servos - ailerons (2), elevator (1), rudder (1), and throttle (1). Standard 40 to 50 inch/ounce servos will work well for this model. However, for better precision, you can upgrade to ball bearing servos in the 60 to 80 inch/ in ounce range, such as Hitec HS-475HB, HS-545BB, or HS-635BB or the Airtronics® 94731Z, 94738Z or 94743Z servos.

For the rudder servo we have used and can recommend that you consider using an after-market reinforced plastic servo arm such as the Du-Bro "Super Strength" products. These output arms are available to fit any brand of servo. They are quite strong and work extremely well with this model. The Du-Bro output arms are molded from considerably stronger material and have held up very well in our prototypes.

You will also need three 6" servo extensions and one standard Y-harness cord or 6" double link extension for the ailerons. In addition, you'll also need one 12" servo extension for the aft mounted elevator servo. These after-market items can usually be obtained from either the manufacturer/distributor of your particular radio system or from aftermarket suppliers, such as Maxx Products in Lake Zurich, Illinois.

Last, because the Sun Dancer 50 uses a total of 5 servos, we suggest that you consider the use a larger capacity airborne battery pack. A battery pack in the 1000+mAh range will provide ample time to safely fly at least five or six flights during any given flying session. This is a reasonable amount of time for most modelers. Naturally, a larger pack provides more flight time but remember that larger can also equate too heavier. We also suggest that you routinely use an Expanded Scale Voltmeter (ESV) at the field to check the charge condition of your batteries. This common piece of field equipment can save your model!

ENGINES & PROPELLERS:

The Sun Dancer 50 has been flown with a variety of engines, both 2 and 4-stroke. As everyone knows, there is no substitute for power and the engine sizes recommended for this model all provide good power margins. The practical range runs from 2-stroke engines in the .46 to .53 sizes and 4-stroke engines in the .56 to .72 displacements. Naturally, the larger engines in this range make more power and will fly the Sun Dancer 50 with more authority than the smaller engines. It is simply a matter of how you want to fly the airplane. You also need to choose a propeller size that is suitable for your particular engine, based on the manufacturer's recommendations. After flying the model and gaining experience, you can experiment with different propellers to find the optimum combination for your engine and airplane.

The Sun Dancer 50 was designed from the start for glow engines and provides ample room inside the cowling to comfortably fit most of the popular engines that are available in both 2 and 4-stroke types.

COVERING MATERIAL:

Your Sun Dancer 50 has been professionally covered with SIG AEROKOTE®. If you live in a drier climate, you may notice that some wrinkles might develop after removing the covered parts from their plastic bags. If that is the case, there is no need to be alarmed. The covering is not defective. This is normal and has and nothing to do with the covering material or how it was applied. Balsawood takes on or loses ambient humidity. Your Sun Dancer 50 was manufactured in a relatively humid region of the world. The wood was therefore holding some humidity at the time the parts were covered and bagged. When these parts are removed from their bags and subjected to drier conditions, the wood quickly loses moisture and the covering may appear loose. This also explains why most iron-on coverings stay tight in the summer only to loosen a little in drier winter conditions.

Modeler's Tip: One of the most common problems associated with shrinking any covering film is controlling the heat around the seams. Heat applied close to or directly onto seams re-heats the covering adhesive and the seams will often "crawl". This is easy to control. Just tear a few paper towels into strips and soak them in cool tap water. Lay the wet strips over the covering seam and use a heat gun or iron as you normally would. The wet strips keep the seam cool while the covering immediately next to it shrinks. This tip works great with any iron-on covering.

Any wrinkles that appear in the covering are easy to remove by using a hobby-type of heat iron. We suggest covering the iron's shoe with a thin cotton cloth, such as an old T-shirt to prevent scratching the film. To shrink AEROKOTE®, set the temperature of your covering iron at 220°F - 250°F (104°C - 121°C). Start by using the heated iron to go over all the seams and color joints, making sure they are firmly sealed and well adhered. Then use the heated iron to lightly shrink the material - do not press on it. Once the covering is tight, lightly iron the material back down to the wood. You can use a hobby type heat gun to re-shrink the covering, but you must be extra careful around the seams.

For part number reference, your Sun Dancer 50 ARF was covered with SIG AeroKote®, using the following colors and part numbers:
SIGRC72ARF(P) - Covered w/ AeroKote® #100 White,
#361 Purple and #360 Violet or
SIGRC72ARF(Y) - Covered w/ AeroKote® #330 Bright Yellow,
#321 Bright Orange and #311 Bright Red

REQUIRED TOOLS:

For proper assembly, we suggest you have the following tools and materials available.

A selection of glues: SIG Thin, Medium and Thick CA
SIG CA Debonder
SIG Kwik-Set 5-Minute Epoxy
SIG Epoxy (slow cure)
Thread locking compound, such as Loctite® Non-Permanent Blue
Screwdriver Assortment
Needle Nose & Flat Nose pliers
Diagonal Wire Cutters
Small Allen Wrench Assortment
Drill and assorted Drill Bits
Pen Vise for Small Diameter Drill bits
Hobby Knife With Sharp #11 Blades
Paper Towels
Rubbing alcohol for clean up
Scissors
Covering Iron and Trim Seal Tool
Masking Tape
Dremel® Tool With Selection of Sanding and Grinding Bits
Felt tip pen

KIT CONTENTS:

The following is a complete list of every part included with your Sun Dancer 50 kit. Use the check-off blocks (❑) to inventory your kit before beginning assembly. Note that the CA type hinges for the ailerons, rudder, and elevators are in place in each of these parts but are not yet glued in place. Also note that the bolts and nuts required to mount your engine to the motor mounts are not included in this kit and must be purchased separately.

Note: Do not remove parts from the plastic bags until they are needed during assembly. All of the required parts, screws, and bolts, etc. will be included in the bag to assemble a particular component of the model.

❑ Bag #1: Top Wing, fully assembled & covered with AeroKote®
Holes for mounting cabane struts pre-drilled in hard points
Holes for inter-plane struts (4) pre-drilled in hard points
Ailerons in place with CA hinges - not glued

❑ Bag #2: Bottom Wing, fully assembled & covered with AeroKote®
Holes for inter-plane struts (4) pre-drilled in hard points
Wing bolt holes pre-drilled
Wing bolt reinforcement plates pre-drilled and installed
Leading edge wing-mount dowel installed
Aileron servo bays opened up
w/ plywood servo doublers in place
Aileron servo installation strings in place
Ailerons in place with CA hinges - not glued
Aileron servo lead holes pre-drilled at center section

❑ Bag #3: Vertical Fin, covered with AeroKote®
Covering removed from bottom for attaching to fuselage
Pre-slotted for the top 2 CA hinges

❑ Bag #4: Rudder, covered with AeroKote®
Pre-slotted for 3 CA hinges
CA hinges in place - not glued

❑ Bag #5: Horizontal Stabilizer & Elevator covered with AeroKote®
Pre-slotted to accept vertical fin
Covering removed from bottom of stabilizer for gluing to fuselage
Elevators attached to stabilizer with 4 CA hinges - not glued

❑ Bag #6: Fuselage, covered with AeroKote®
Windshield installed with 3 M2 X 8mm PWA screws
3mm Motor Mount Blind Nuts installed with fuel tank opening in firewall
Fuel Tank Hatch installed w/ 4 M2 X 6mm PWA screws
Fuselage pre-slotted for cabane struts
Fuselage pre-drilled for cabane strut bolts
w/ 3mm blind nuts installed
Fuselage pre-drilled for landing gear attachment
w/ 4mm blind nuts installed
Hard point for tail wheel mounting
Fuselage slotted at tailpost for bottom rudder CA hinge
Bottom Wing Bolt Tray installed
w/ two 1/4-20 blind nuts installed
Firewall fuel-proofed

❑ Bag #7: Cowl, fiberglass, painted to match model
Cowl pre-drilled for mounting screws
- ❑ Sub Bag A: 6 each M2.6 X 8mm PWA Cowl Mounting Screws

❑ Bag #8: Wheel Pant Set (1 left, 1 right), painted to match model
2 each 3mm Blind Nuts installed in each wheel pant

❑ Bag #9: Main Landing Gear, painted to match model
Pre-drilled mounting holes for fuselage attachment & wheel axles
- ❑ Sub Bag A: 2 each Main Wheels, 2-1/2" dia.

❑ Bag #10: Fuel Tank Assembly (260cc) - Fuel Tank Body with clunk fuel line inside
- ❑ Sub Bag A: Rubber Tank Stopper
Tank Clunk Fuel Pick-up Weight
Threaded Backplate w/ 3 holes for tubing
Faceplate w/ 3 holes for tubing
3 lengths of Aluminum Tubing
1 each M3 X 20mm Compression Bolt

❑ Bag #11: Cabane Strut Assembly (4), pre-bent, pre-drilled, and painted white
- ❑ Sub Bag A: 4 each M3 X 9mm PWA Mounting Bolts

❑ Bag #12: 5 each Nylon Control Horns & 3 each Backplates
- ❑ Sub Bag A: 12 each M2 X 15mm Bolts
4 each M2 X 20mm Bolts
2 each M2 hex Nuts
- ❑ Sub Bag B: 4 each Nylon Inter-Connect Horns w/4 each Backplates

❑ Bag #13: Motor Mount Assembly (1 left, 1 right)
- ❑ Sub Bag A: 4 each M3 X 20mm Bolts
4 each 3mm Washers
4 each 3mm Lock Washers

❑ Bag #14: White Spinner Assembly – 2-1/4 dia. Cone & Backplate
- ❑ Sub Bag A: 2 each 2.6mm X 12mm Screws
1 each Propeller Shaft Adapter Moldings

❑ Bag #15: Tail Wheel Assembly
- ❑ Sub Bag A: 2 each Tail Wheel Centering Springs
- ❑ Sub Bag B: 1 each Rudder "T" Bracket, pre-drilled
2 each M2 X 10mm PWA Screws
3 each M2.6 X 12mm PWA Screws

❑ Bag #16: 2 each Interplane Struts (1 left, 1 right), covered with AeroKote®, pre-drilled with 3mm mounting holes w/ 3mm Blind Nuts installed
- ❑ Sub Bag A: 10 each Aluminum Strut Attach Fittings
10 each M3 X 10mm PWA Bolts
2 each 3mm Lock Nuts

❑ Bag #17: 2 Molded Plastic Aileron Servo Hatch Mounts (1 left, 1 right)
4 each 8mm X 20mm X 20mm Hardwood Servo Mounting Blocks
- ❑ Sub Bag A: 12 each M2 X 8mm PWA Screws

❑ Bag #18: 4 each Pull-Pull Rigging Couplers w/metal R/C links & knurled stop nuts
2 each .56mm (.022") X 27-3/4" Braided Steel Pull-Pull Cables

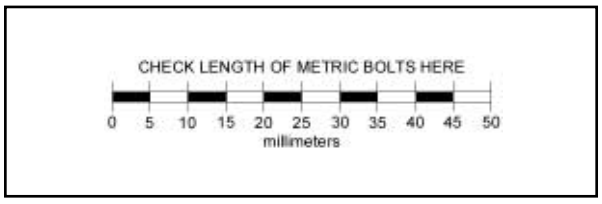
❑ Bag #19: 2 each M4 X 40mm Axle Bolts
2 each 4mm Hex Nuts
4 each 4mm Lock Nuts
2 each 4mm X 15mm Landing Gear Attach Bolts
2 each 4mm Washers
2 each 4mm Lock Washers
4 each 3mm X 10mm Wheel Pant Attach Bolts
4 each 3mm Lock Washers

❑ Bag #20: 1 each 5mm OD X 4mm ID X 30-1/2cm (12") Outer Throttle Linkage Tube
1 each 3mm OD X 2mm ID X 40cm (15-3/4") Inner Throttle Linkage Tube
1 each 8mm X 12mm X 100mm Fuel Tank Retainer Block - Balsawood
1 each 2.6mm X 38mm Throttle Tube Retaining Bracket - Plywood
- ❑ Sub Bag A: 2 each 1/4-20 X 1-1/2" Nylon Wing Bolts
- ❑ Sub Bag B: 2 each Nylon R/C Links
2 each 2mm X 22mm Threaded Studs
- ❑ Sub Bag C: 2 each 2mm X 162mm Aileron Inter-Connect Drive Wires w/ Z-bend at one end and threaded metal R/C link at other end
2 each 2mm Threaded Knurled Nuts
2 each 2mm X 36mm Aileron Pushrods w/ Z-bend on one end and metal R/C link on the other end
1 each 2mm X 86mm Elevator Pushrod w/ Z-bend on one end & metal R/C link on the other end

Miscellaneous Items:

❑ 1each Sun Dancer 50 ARF Assembly Manual

❑ 1each Sun Dancer 50 ARF Decal Sheet



Note: In addition to the above parts, you will need the following specific items:

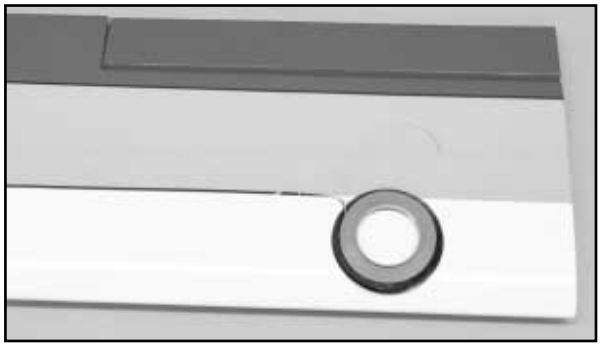
4-Channel R/C System with 5 Servos
Engine
Engine Mounting Bolts, sized for your engine
Fuel Tubing of correct size for your engine
Propeller to fit your engine
Foam Rubber for mounting receiver and battery pack
Clear Silicone RTV Sealer

OPTIONAL:

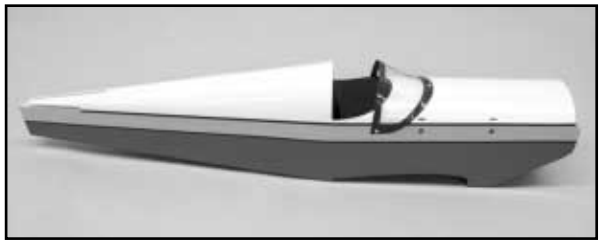
Some modelers may want to dress up their Sun Dancer 50 by using trim tape to separate and accent the main colors. Use a good quality striping tape to cover the seams where the colors meet. This is easy to do and gives a very nice finished look to the overall model. We have found that it is easier to apply this trim before assembling the individual parts.

For a model this size, we suggest using 3/32" or 1/8" wide tapes. Of course you can choose your own colors, but we would suggest that for the yellow, orange, and red model, silver or medium blue

tape. For the purple, violet, and white model, silver or light red trim looks great. Whatever color you choose, be sure to use good quality striping tape, applying it smoothly, avoiding wrinkles when working the tape around the corners. When the trim is complete, seal it in place with low heat (180° - 200° F). SIG "SUPER STRIPE" color trim tapes worked very well on our models.



Another detail that dresses up the looks of the Sun Dancer 50 is the windshield frame. Since the windshield is screwed to the fuselage, it is easy to remove and paint the frame. Use contrasting color paint or striping tape on the raised "frame" portions of the windshield to simulate the metal windshield framing used on full sized aircraft. To assure good adhesion of your trim,always wash the windshield in warm water and liquid dish soap. Rinse and dry completely before applying.



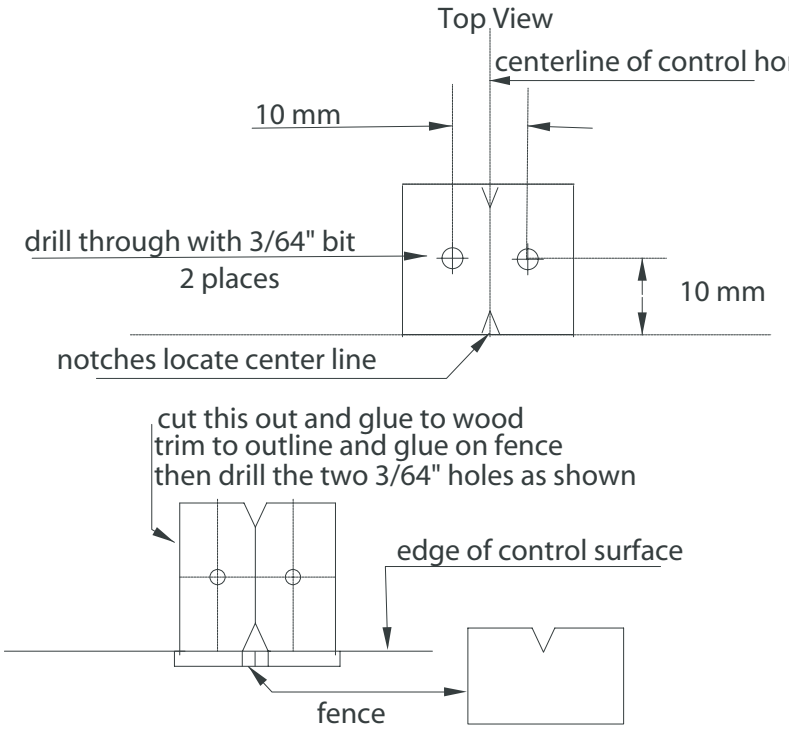
While the windshield screws are out, use thin CA and a fine applicator tip to put a drop or two of glue into each screw hole to harden the threads. This will help to prevent these screws from loosening from vibration.

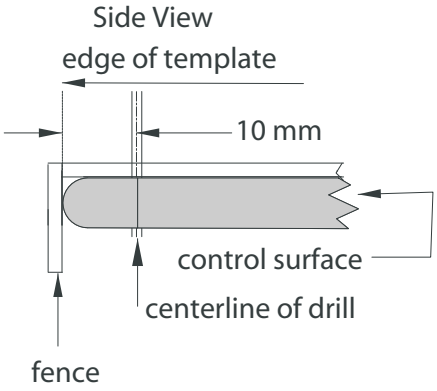
The firewall and tank compartment of your Sun Dancer 50 has been factory treated with fuel proofing at the factory. However, you may wish to add additional fuel proofing of your own. We suggest using thinned epoxy glue or water-soluble polyurethane varnish. Simply remove the hatch under the tank compartment for access to the interior of the tank compartment.

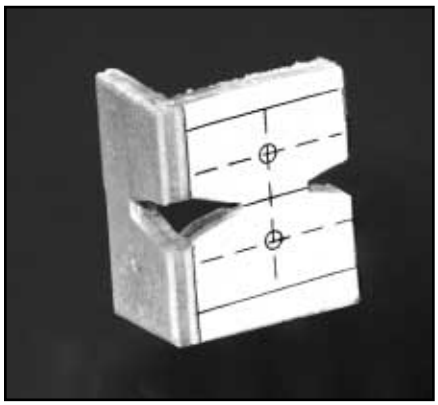
MODELER'S TIP: To help locate the drilled holes needed to mount the nylon control horns and nylon inter-connect horns, a small template, which is shown below, that can be used to make a simple jig.

Control Horn Drill Template

construct from 1/8" lite-ply or balsa



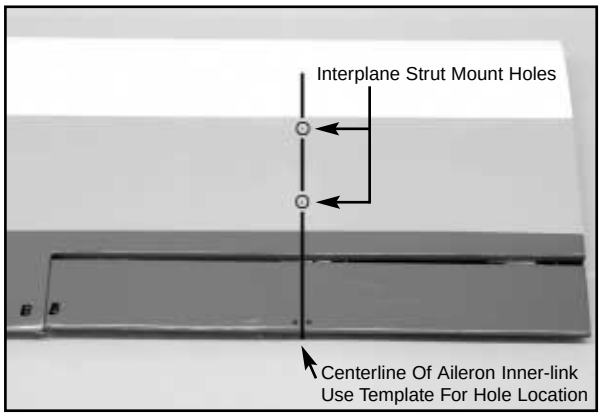




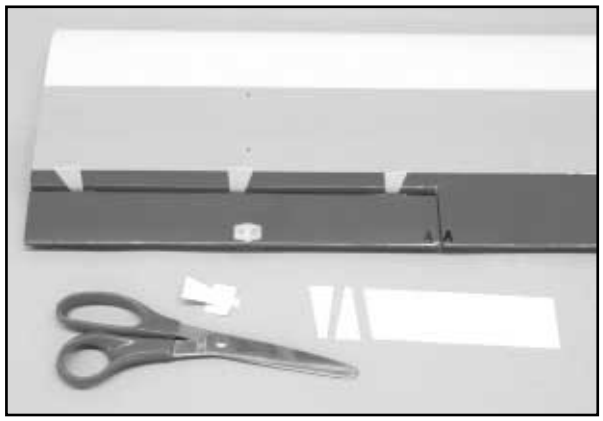
To mark the drill holes, align the template center line notches on the center line that is drawn on the control surface. Slide the fence tight against the edge of the surface and mark the drill locations though the drilled holes.

TOP WING ASSEMBLY:

❑ 1) The top wing has no dihedral or servo wells. First you will need to identify the bottom surface of the wing. The bottom surface has 6 holes for the attach fittings to thread into. Before removing the ailerons, identify them with a felt tip pen as shown, for left and right on the bottom. Also mark the trailing edges of the ailerons for the nylon inter-connect horns. This location is on a line through the strut attachment holes to the trailing edge of the aileron, as shown. Remove the ailerons from wing and using the hole locator template to locate the holes, drill two 5/64 dia. holes. Mount the nylon inter-connect horns to the bottoms of the ailerons, with 2 - M2 x 15mm bolts and backing plates. Before mounting the horn, remove the pen marks with a little debonder.

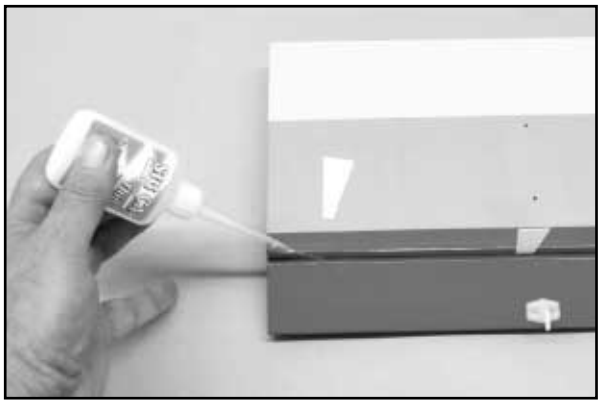


❑ 2) The ailerons are now permanently hinged to the top wing. Note that three aileron hinges have been factory-installed in each aileron, but are not yet glued. Remove all the hinges from the ailerons and wing. Note that the supplied hinges have a die cut slot in the center that can be used to accurately place and center the hinge equally into both the wing panel and the aileron. To do this, cut an old business card into wedges that will fit halfway through the slot.



Press the three hinges into the wing panel up to the center slot. Place one of the card wedges into each hinge and press the aileron in place onto each exposed hinge half. Position the aileron so there is about 1/32" gap between the end of the aileron and the wing and push the aileron to the wing until the paper wedges are snug between the surfaces. Flex the aileron downward to expose the hinges between the wing and aileron. Hold the ailerons in this position with a piece of masking tape. The hinges are now in position to be glued in place.

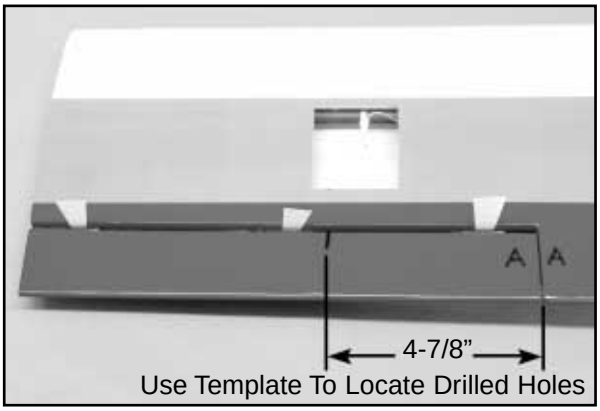
IMPORTANT NOTE: When installing CA type hinges, *more is not better!* Applying excess thin CA glue to this type of hinge does nothing more than stiffen it, potentially causing the hinge to break. If you have followed these instructions, each hinge will have a total of 8 small drops of thin CA glue on each side. This is the correct amount of adhesive.



Remove the card wedge from one of the hinges and carefully apply four (4) small drops of thin CA glue to the left and right side of the exposed hinge. Repeat on the other two hinges. Remove the masking tape, flex aileron in opposite direction, and again use tape to hold it in this position. Turn wing over and apply four drops of thin CA glue to each exposed edge of each hinge exactly as before. Remove the tape and return the aileron to its centered position. Because it takes a little time for the CA glue to fully wick through the surface of the hinge and the surrounding wood, allow at least 10 minutes before flexing the aileron. Repeat this process on the opposite aileron. Apply four (4) small drops of thin CA glue to each of the six holes for the attach fittings. Clean up any excess glue drops, runs, or smears on the covering with SIG CA DEBONDER and a paper towel.

BOTTOM WING ASSEMBLY:

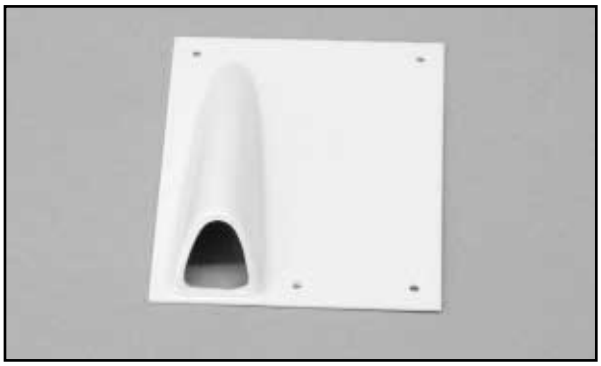
❑ 3) The bottom surface of the lower wing has the openings for the aileron servos. Again, identify the left and right ailerons with your marker pen and also mark the position for the control horns, as shown. Remove the ailerons and using the marks just made, install the control horns on the bottom surfaces of each aileron, using the marks just made. Temporarily re-install the ailerons back in place to the wing.



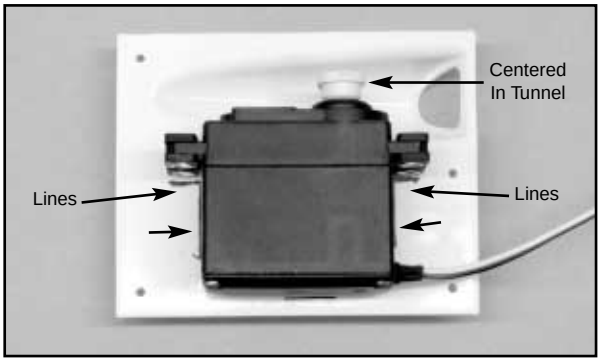
Turn the wing over and mark the tops of each aileron for the nylon inter-connect horn locations, as previously shown on the top wing. Drill 5/64" dia. mounting holes for attachment of the nylon inter-aileron control horns, as shown for the top wing. Using the

provided hardware, mount the nylon inter-connect horns in place to each aileron. The ailerons are now permanently hinged in place, using the same procedure used on the top wing.

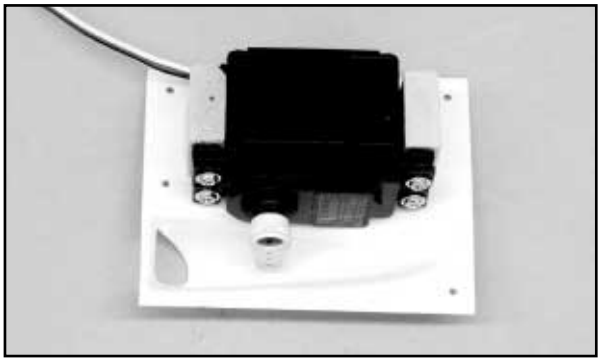
❑ 4) Locate the bag with the aileron servo hatch covers, servo mounting blocks, and screws. Note that there is a left and right servo hatch cover. These fit into the servo bay with the pushrod fairing towards the wing tip and the pushrod opening towards the aileron. The pushrod exit needs to be opened up. Drill through the angled surface with a 1/4" drill, then finish opening the exit with a #11 blade and sand paper wrapped around a pencil or dowel.



Lightly sand the inside surface where the servo will sit to break the glaze on the plastic. Insert the grommets and eyelets in the mounting holes of your servos as recommended by the manufacturer. Now lay your servo on the inside of the hatch cover, centering it from end to end and centering the output arm within the pushrod fairing. Use a pencil to mark where both ends of the servo and where the bottom of the grommets are.

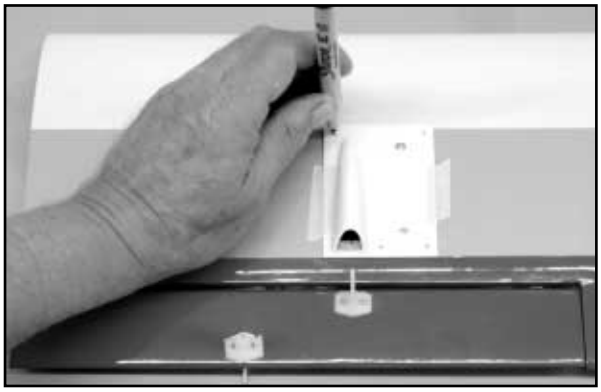


These marks are where the servo mounting blocks (8mm x 20mm x 20mm hardwood) will be glued to the hatch with epoxy. When the glue cures, use a ruler to find the approximate center of each block and mark the location on the plastic on the opposite side from the block. With a 1/16" bit, drill a pilot hole at each mark about 1/4" deep through the plastic into the wood block. Install a M2 X 8mm PWA screw into each hole, securing the block to the



hatch. Now lay the servo on the cover with the mounting lugs on the wood blocks and mark through the center of the grommets where the pilot holes for the mounting screws need to be drilled. With a #50 bit, drill each pilot hole about 1/2" deep. The servos are now mounted in place using the screws provided with your servos.

❑ 5) The completed servo hatch covers, with the servos in place, are now ready for mounting into the lower wing. Carefully insert the servo cable into the leading edge of the servo bay ahead of the spars and lower the hatch into position. If the stick of wood with the string is in the way, break it loose and lay it in the servo bay for now. Feel the covering on top surface of the wing above the servo to make sure the servo is not in contact and causing an unsightly hump. You may need to slide the hatch towards the leading edge with some servos to get this clearance. Tape the hatch in place with small pieces of tape and mark where to drill the pilot holes. Use the pre-drilled holes in the hatch to locate these holes. Then use a 1/16" bit to drill the pilot holes. Be careful when drilling not to run the drill through the top of the wing.

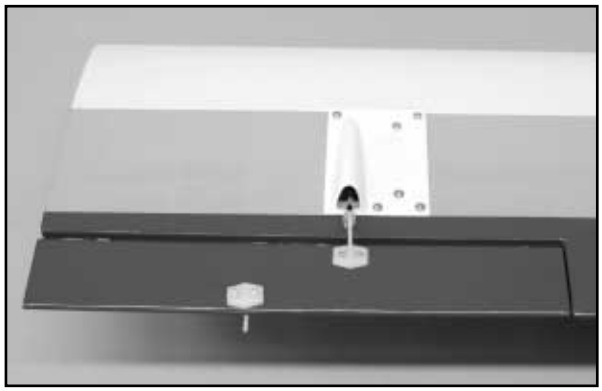


❑ 6) Remove the hatch and plug one of the 6" servo extensions in on each servo. Because this connection will be buried in the wing, secure the connectors with heat shrink tubing or tape. It is now time to center both servos. Remove the servo arms and set them aside. Plug the extensions into the "y" harness and the "y" harness into the aileron socket of your receiver. Two 2mm x 36mm aileron pushrods with a Z-bend on one end and a metal R/C link on the other have been provided for the ailerons. Each pushrod is pre-assembled at the factory. Connect the Z-bend end of the pushrod to the middle hole of the servo arm and through the exit hole in the cover before proceeding to the next step. Turn on your transmitter and center the aileron trim lever. Now turn on the receiver and let the servos neutralize before adjusting the servo arms to position them as close to 90° to the side of the servo case as possible. With the servo arms now positioned correctly, re-install the servo output arm screws. Turn off the radio system and remove the servo leads from the Y-harness.

❑ 7) The length of string in each wing panel has been factory-installed to make it easier to pull the servo wires, with their attached extension cords, through the openings in each wing

panel. Securely attach the servo bay end of the string to the connecting plug of the 6" extension. Gently pull on the opposite end of the string to pull the servo extension through the wing while feeding them into the servo opening in the wing. Take your time and do not pull too hard on the string. It is sometimes helpful to stand the wing vertical when trying to feed the extension through the openings in each of the wing ribs. When the extension is through the opening at the center of the wing, tape it in place to keep it from slipping back into the wing. Screw the hatches in place using M2 X 8mm PWA screws provided. Plug the servo leads into the "Y" harness and secure with heat shrink tube or tape.

❑ 8) Tape the lower ailerons in the neutral position, turn on the radio and recheck the servos for neutral. Adjust the length of the pushrod by turning the R/C links in or out until the connecting pin matches the outer hole of the control horn. Snap the R/C Link in place onto the horn. Using the radio, check for correct movement. Turn off your radio and set the wing aside for now.



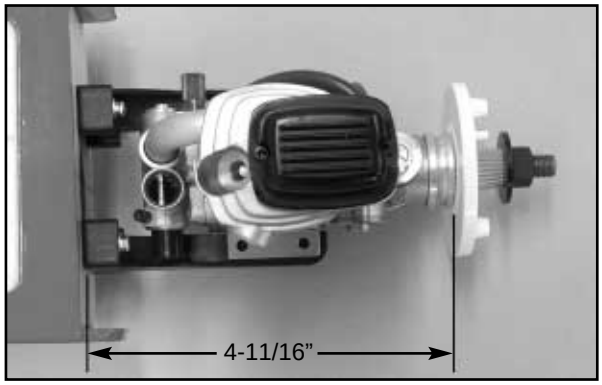
Note: Before starting work on the fuselage it is advisable to temporarily remove the windshield and set it aside for now. Because you will be working with the fuselage upside down quite a bit, doing this saves the windshield from damage during construction.

ENGINE MOUNTING:

MODELER'S NOTE: With the variety of engines that are available today, it is not practical to pre-drill the holes in the firewall for the nylon pushrod housing. Each engine manufacturer has the carburetor mounted in a different positions and/or orientations. The following photos show how we installed our YS engine in the Sun Dancer 50, but these instructions should be similar for other engines as well.

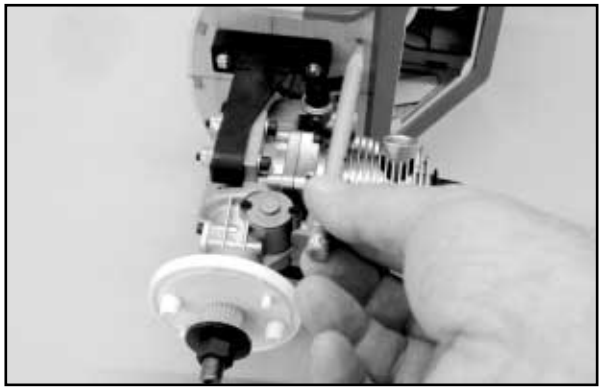
❑ 9) The YS-63S fits with the bolts centered in the slots of the motor mounts. Move the mounts slightly, if needed, to fit your engine properly and tighten the bolts using blue Loctite® to keep them secured.

❑ 10) With the motor mounts now in place, it is time to locate the engine on the mounts and drill the mounts for the mounting bolts. Position the engine on the mounts so that the distance from the face of the prop drive washer to the firewall is 4-11/16". Make sure the engine is sitting square in the mounts, and then mark the mount for drilling the four mounting bolt holes through the mount arms. These holes should be clearance holes for the bolt size that is proper for your engine. We prefer to use socket head cap bolts, aircraft lock nuts, and lock washers on our airplanes for the extra strength and ease of installation.

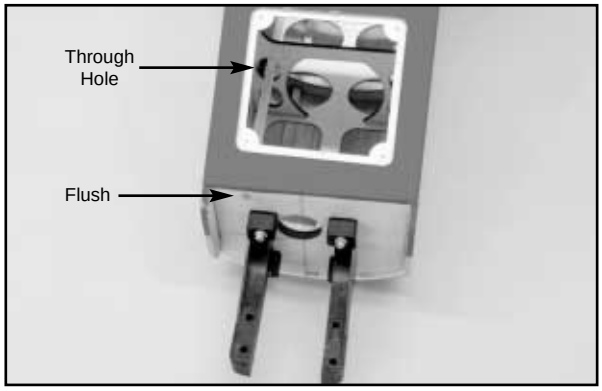


The engine is now temporally installed on the mounts to locate the throttle pushrod.

❑ 11) For the YS engine you will need to rotate the throttle arm 180° to clear the motor mount and tank. Check your engine installation and adjust as needed. Use a pencil to mark the firewall at the point where the throttle pushrod will be placed.



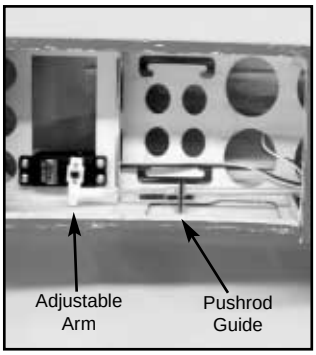
❑ 12) Remove the engine from the mounts and use a 13/64" drill bit to make a hole through the firewall at the mark just made. Insert the nylon pushrod housing through this hole and pull it through one of the oval holes in the tank compartment bulkhead, into the servo area. Note that it will have a slight arc or bend in it from the firewall to where the servo output arm will be. Use epoxy or CA glue to mount the throttle housing tube in place with its end flush with the front of the firewall.

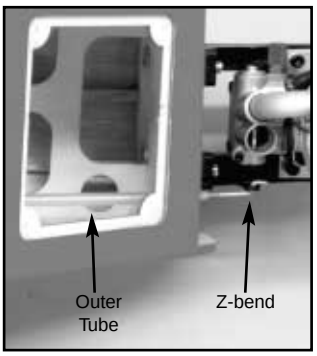


❑ 13) The throttle servo is now mounted in place in the fuselage. The servo can be mounted on either the left or right side of the fuselage, depending upon which side the throttle pushrod housing is closest to. From parts bag #20, locate the plywood throttle tube retaining bracket. Slide the bracket over the throttle pushrod tubing. Trim it's length to position and hold the pushrod housing tubing in alignment with the throttle servo arm. Glue the bracket to

the inside of the fuselage, about 2" ahead of the throttle servo, using epoxy or thick CA. Trim the throttle housing tube so that it only extends about 1/4" past the guide.

❑ 14) With the outer pushrod housing tube in place, the inner throttle pushrod is now prepared. Thread the provided 2mm x 36mm Z-bend link into one end of the inner nylon pushrod. Drill out the hole in the carburetor throttle arm with a #46 drill, to allow the Z-bend to fit. Insert the Z-bend into the throttle arm, slide the inner pushrod into the outer housing tube and mount the engine with 2 bolts to hold it in the proper position. Move the throttle arm to the closed position and note if this moves the pushrod in or out of the firewall. Turn on your radio and use the reversing function to make the throttle servo move in the correct direction when you pull the throttle down to idle. Adjust the throttle trim to its lowest setting, making sure the carburetor is at its lowest idle/cutoff position. Now trim the inner pushrod to make the end 1-1/2" short of the servo output arm hole you will be using. Now thread the 2mm x 22mm stud about 1/2 way into the servo end of the inner pushrod and then thread a nylon R/C link onto the stud. Adjust until the servo drives the throttle arm to just touch the idle stop when the trim is full down on the transmitter. Next move the throttle stick to full throttle and the trim to full up. Adjust the endpoint in the transmitter until the throttle is fully open. It is important that the servo should not growl or the pushrod flex at either end of these throws. If you are using a non-computerized transmitter, an easy way to adjust the throw is to use the adjustable servo arm that comes with most servos as shown in the photo.





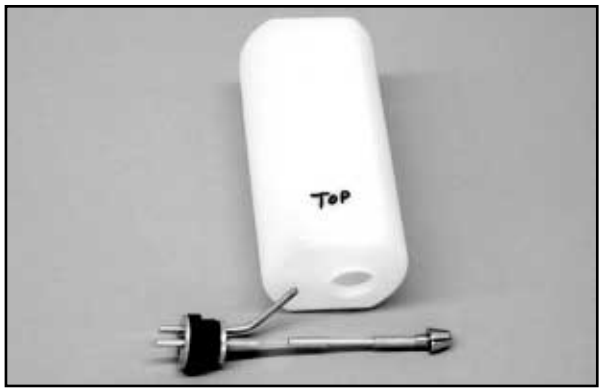
FUEL TANK ASSEMBLY:

❑ 15) Locate the parts bag containing the fuel tank assembly. We use a simple two-line fuel delivery system for this airplane. Note that the rubber fuel stopper has two holes all the way through it. Use these two holes for the two aluminum fuel lines.

Two pieces 1/8" aluminum tubing have been provided for venting the fuel tank. The first piece is 2-3/8" in length and the second is 2". Holding the front and rear metal compression disks in place to the front and back side of the rubber stopper, insert the 2" piece of aluminum tubing into the rubber stopper for the fuel pick up tube, leaving 1/2" of the tube protruding out the front of the stopper. Next, make a gentle 60° bend in the middle of the 2-3/8" aluminum tubing, (making two equal sides), to make the overflow vent tube. Insert this piece completely through the stopper assembly in the same orientation as shown in the photo, again leaving a 1/2" of the tubing protruding from the front face of the stopper.

Note: The neck of the fuel tank is NOT located in the center of the tank body and is offset to one side. When looking at the front of the tank, the neck should be offset to the right. The side of the tank that is up will be top of the tank when mounted in the airplane and should be marked for reference.

❑ 16) Insert the clunk fuel pick-up weight into one end of the silicone fuel line that was inside of the tank. Lower this assembly into the tank until the clunk touches the back of the tank and mark this distance. Measure 1/2" towards the clunk from this mark and cut the tubing off at that point. Slide this tube onto the pickup tube on the back of the stopper assembly and inset this assembly into the tank. The clunk should be about 3/8" from touching the back of the tank, allowing it to swing free within the tank body.



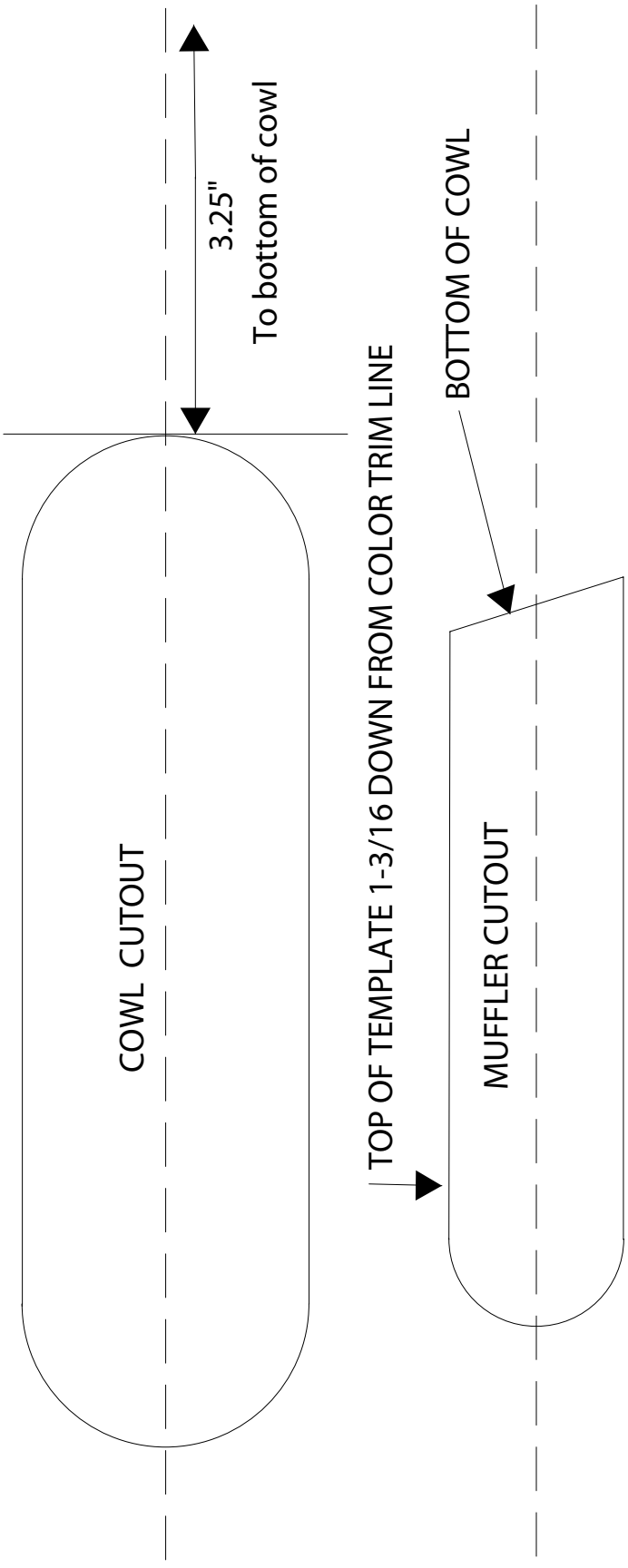
The vent tube should just touch the top of the tank at an angle. Adjust as needed before tightening the stopper into place, using the supplied M3 x 20mm compression bolt. Tighten this bolt sufficiently to compress the rubber stopper, creating a good tank seal. Attach an 8" length of fuel line to each tube at the front of the tank and use tape to identify each line as the "vent" and "fuel" line. Pressure test the tank and fuel line, then repair leaks, (if any). The fuel tank is now ready to install in the fuselage.

❑ 17) Working through the wing opening in the bottom of the fuselage, slide the fuel tank into position while routing the fuel lines through the firewall. Because of the offset neck, it will only line up with hole in the firewall one way. When you are satisfied with the fit, remove the tank and apply a generous bead of clear silicone RTV around the stopper/neck of the tank, where it will contact the firewall. Slide the tank and fuel lines back into place, pressing it firmly to the back of the firewall. The 8mm x 12mm x 100mm balsa fuel tank retainer is now pressed in place against the back of the tank. Use a little thin CA glue to glue it in place. To help hold the tank in place and provide some cushioning from vibration, squeeze some RTV between the fuel tank and the rear bulkhead and on the retainer block before installing it behind the tank.

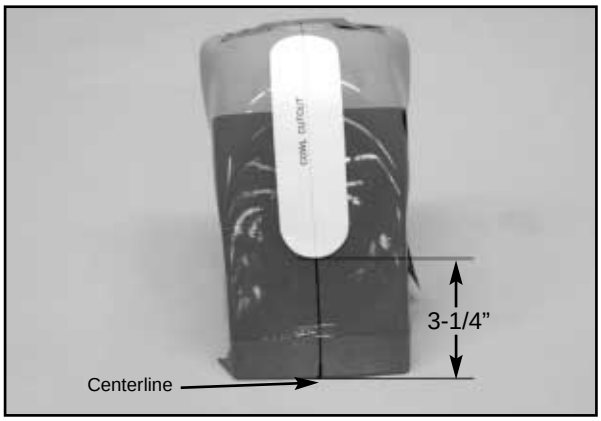
MOUNTING THE COWL:

❑ 18) Inspect the inside rear edges of the cowl. If needed, use sandpaper to smooth the inside rear surface, making it free of any bumps or ragged edges that may scratch or dent the fuselage when pressed in place. Also, make sure the six mounting holes in the sides of the cowl are open and free of any debris. For

COWL AND MUFFLER CUTOUT TEMPLATE



inverted mounted engines you will need to open up the bottom of the cowl as shown in the picture to provide cylinder clearance and cooling air for the engine. Use the provided template above to mark out the area to be removed.

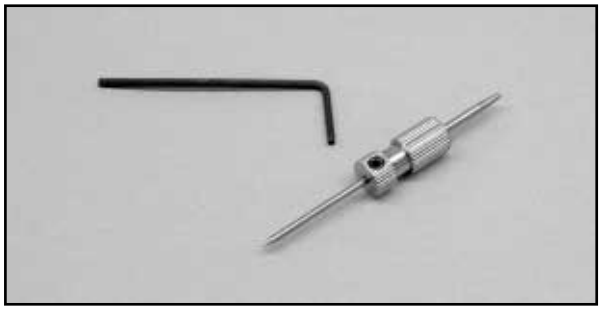


TIPS ON CUTTING HOLES IN FIBERGLASS: Always wear safety glasses and a mask of some kind to avoid inhaling any fiberglass dust. Use a fine point marker to draw an exact outline of the area you want to cut out. Then use a Dremel® Tool with a parting wheel to remove the material just inside the lines you have drawn, then switch to a drum-sanding tool to neatly finish the cutout. Work slowly and carefully when removing the material from the cowl. Check your progress often and make sure you are not removing too much material. Finally, use #220 sandpaper by hand to clean up and smooth any rough or jagged edges. Make sure all edges are free of any loose glass fibers. Be careful not to sand the paint on the outside of the cowl. Remove all fiberglass dust from the cowl with a tack rag or with alcohol on a clean cloth.

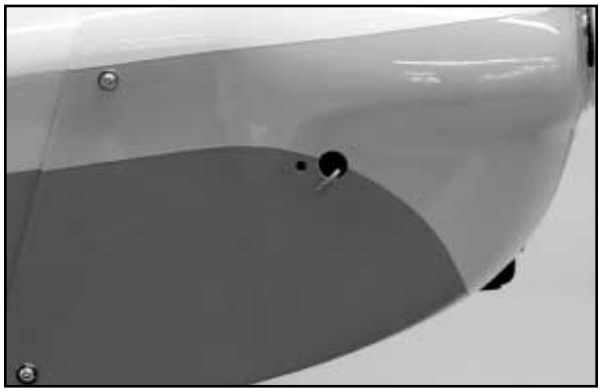
❑ 19) Slide the cowl over the mounted engine until the prop drive washer protrudes through the spinner fairing hole at the front. We used a 1/16" clearance measurement for the distance between the back of the spinner backplate and the very front of the cowl. To do this, tack glue four scrap pieces of 1/16" balsa onto the rear of the spinner backplate. Mount the spinner backplate onto the engine and hold it in place by lightly bolting a prop on top of it. Slide the cowl up to the spacers on the back of the spinner backplate, center the spinner fairing to the back of the spinner and tape in place. Now line up the color part lines at the back of the cowl with the same lines on the fuselage and tape the cowl to the fuselage in this position. Using the six holes, (3 on each side of the cowl), as guides, drill six 1/16" dia. pilot holes for the cowl mounting screws. Drill each hole about 1/4" deep. Remove the cowl from the fuselage. Apply a couple of small drops of thin CA into these holes to harden them.

❑ 20) Most engines will require another cut out in the cowl to clear the exhaust system. The engine, shown in this manual, is the YS-63S and the photos show how we cut the cowl to clear its exhaust system. If you are using a different engine, then you will have to use the same technique to create the required cowl clearance hole for your particular engine. For most engine installations, there is more than an adequate amount of openings provided in the cowling for cooling air to enter and exit. A rule of thumb is that the exit area must be equal to or larger than cooling air inlet. There should be at least 1/8" of clearance between the cowling and any accessory such as muffler and/or carburetor.

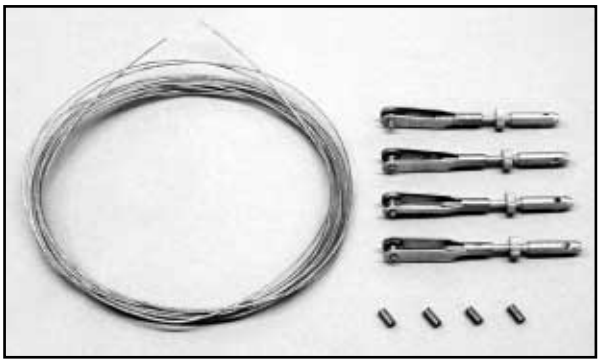
❑ 21) With the cowl now in place, you need to consider the needle valve. Most engines come with a needle valve that has a pre-drilled hole in its center and a setscrew. This is used when attaching a needle valve extension. Our YS 4-stroke has just such a needle valve assembly and the pre-drilled hole accepts 1/16" dia. music wire. To locate the required needle valve extension hole in the cowl, we put a short length of 1/16" dia. music wire into the hole in the needle valve and tightened the setscrew to hold it firmly.



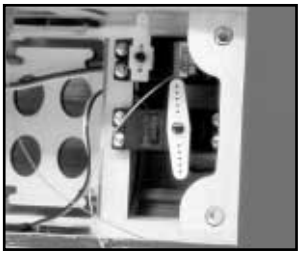
The needle is then threaded back in place all the way into the carburetor. Place a straight edge against the side of the fuselage at the nose, intersecting the piece of wire and mark this point on the wire. Remove the wire from the needle valve, cut the wire at the point you just marked then sharpen the wire to a needlepoint. Insert the wire back into the needle valve, tighten the setscrew and install the cowl onto the fuselage. Turn the fuselage upside down on your work surface and use a pair of needle nose pliers or hemostats to begin turning the needle out. As the needle rotates outward, the sharpened end of the wire will come into contact with the inside surface of the cowl. Hold a scrap piece of wood against the outside of the cowl, over the pointed wire, and continue unthreading the needle valve until you get a definite dimple on the outside of the cowl. When you see this mark, screw the needle valve back into the carburetor and remove the cowl. Using the dimple on the cowl for center, use a 3/32" dia. bit to drill through the side of the cowl. Remove and discard the sharpened piece of music wire from the needle valve. Make sure the needle valve setscrew is aligned to allow access to it when the cowl is in place. Cut a new length of 1/16" music wire about 4" long. Reinstall the cowl and insert the wire through the cowl and into the hole in the needle valve and tighten the setscrew. Turn the needle all the way in and make a mark on the wire, about 1/8" outside the side of the cowl. Remove the wire from the needle valve and cowl and make a 90° bend in the wire, at the mark. Trim the excess wire from the bent end, leaving about 3/8" to grip on. Insert the wire back into the cowl and needle valve and tighten the setscrew. You now have a neat looking, perfectly aligned needle valve extension.

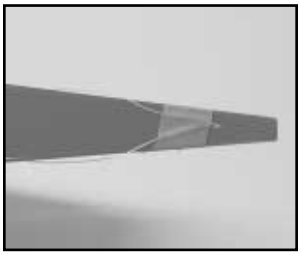


❑ 22) The rudder pull-pull system can now be installed. From the kit contents, locate the 2 Steel Cables, 4 Swage Tubes, 4 Threaded Rigging Couplers, and 4 Metal R/C links.

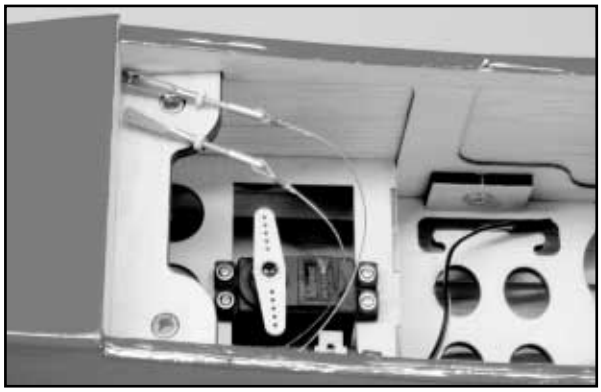


Mount the rudder servo in place using the screws and hardware provided by the servo manufacturer. As previously mentioned, we highly recommend using the Du-Bro super strength servo output arms for the pull-pull rudder system. Plug the servo into the rudder outlet in the receiver, turn on your radio system and center the servo, making sure that the transmitter rudder trim is in the center position also, and install the servo output arm on the servo. Turn off the radio system. The pull-pull cables have been provided in two equal lengths. Insert one of the cables into each of the pull-pull exits located in the rear of the fuselage. Pass the cables completely through the rear of the fuselage and up to the rudder servo location. Keep pulling the cables forward until you have about eight inches of cable remaining at the rear of the fuselage. Tape the cables in place at the rear of the fuselage with small pieces of masking tape to prevent the cable from slipping out of the pull-pull exit tubes.

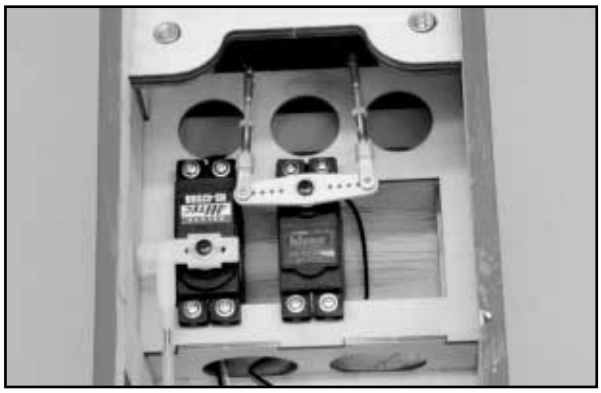




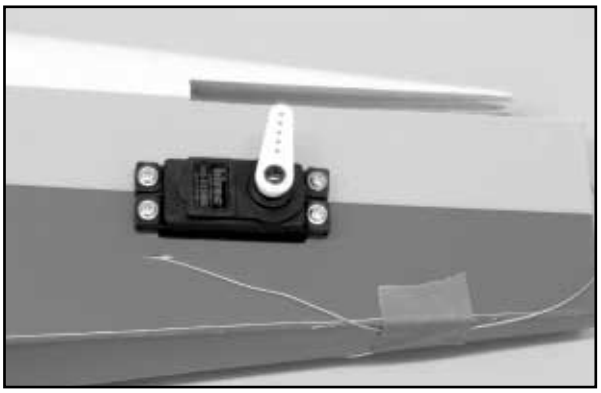
On the servo end of the cable, slide one of the copper swage tubes onto the end of one of the cables. Then insert the end of the cable through the small hole in the end of a threaded rigging coupler, giving yourself about 2"-3" of cable to work with. Loop the short end of the cable back and run it back through the copper swage tube. Pull the swage tube up to about 1/2" away from the rigging coupler, and use a pair of pliers or a crimping tool to squeeze the copper tube tightly over the cable, locking it in place. Cut off the excess at the short end of the cable and wick one drop of thin CA into the swage tube to help lock the cable in position. Repeat this process to make the same connection with the remaining piece of cable.



Attach the rigging couplers to the servo output arm as shown in the photo. Make very sure that the rudder cables do not cross over each other in the rear of the fuselage. Each cable should run straight from each side of the servo output arm to the exit tubes at the rear of the fuselage. Pull slack out of the cables and retape them at the rear of the fuselage. Note that the rudder ends of the cables will be assembled after the fin and rudder are glued in place on the fuselage.

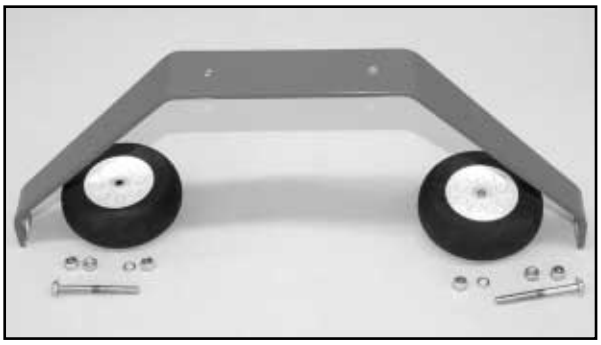


❑ 23) Plug the 12" extension cable to the elevator servo, secure the plug with heat shrink tube or tape and thread the cable into the fuselage through the servo opening. Mount the elevator servo in the fuselage at this time using the hardware and screws provided by the servo manufacturer.

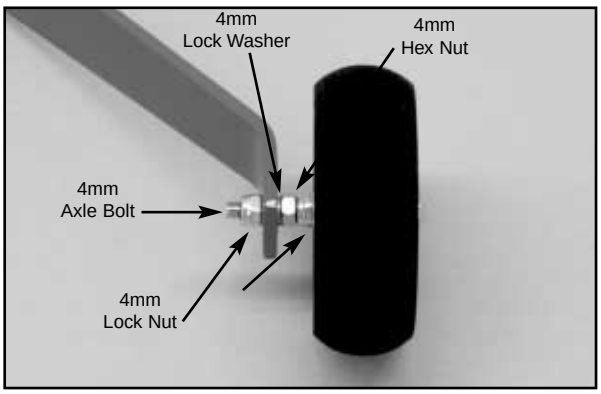


LANDING GEAR AND WHEEL PANTS:

❑ 24) The landing gear assembly, complete with wheels and wheel pants is now assembled and mounted to the fuselage. We suggest you use Loctite® "Blue" non-permanent thread locking compound on all bolts used in this assembly. From your parts bags, locate the two 2-1/2" dia. main wheels, the two M4 x 40mm steel wheel axle bolts, four 4mm axle lock nuts, and two 4mm hex nuts.



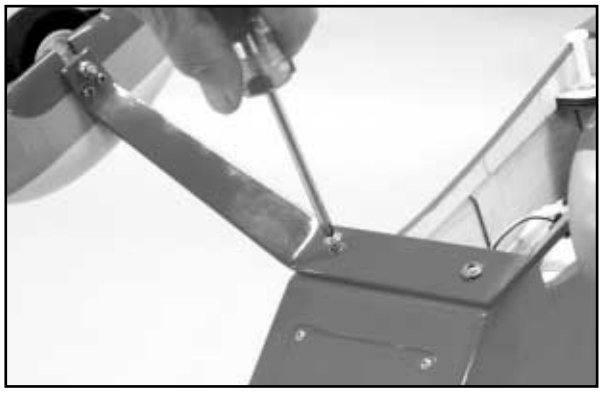
Insert the M4 x 40mm axle bolts into the wheels and thread one of the 4mm lock nuts onto the bolt until there is about 1/32" side play for the wheel. Thread the 4mm hex nut down on the lock nut to act as a spacer, and add a 4mm lock washer. Insert this assembly into the large hole at the bottom of the aluminum landing gear and secure with the other 4mm lock nut.



❑ 25) Note that there is a front and rear edge to the aluminum landing gear - the legs are tapered. When the landing gear is placed upside down on a flat surface, gear legs up, the leading edge (front) is 90° to the table. The trailing edge (rear) is slightly angled. Be sure to orient the mounting of the wheel pants to the

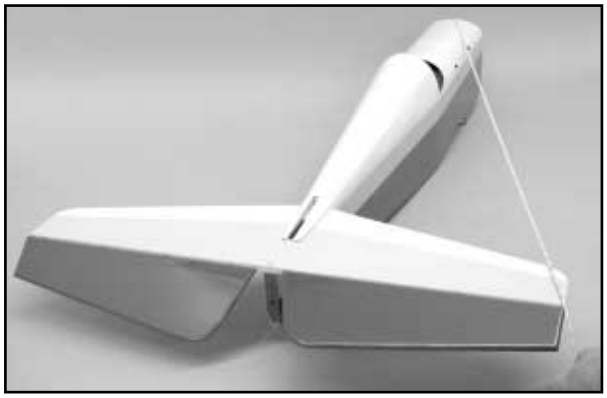
gear and the gear to the fuselage in this configuration. Locate the two fiberglass wheel pants and use the four M3 x 10mm bolts and four 3mm lock washers to attach the wheel pants to the landing gear over the wheels.

❑ 26) The completed landing gear assembly is now mounted to the bottom of the fuselage using the two provided M4 x 15mm bolts and two 4mm washers. Tighten these bolts securely.

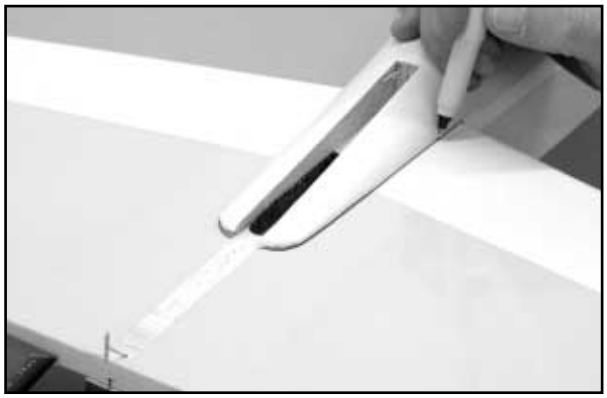


HORIZONTAL STABILIZER AND ELEVATOR INSTALLATION:

❑ 26) For visual reference in these steps, start by first mounting the lower wing to the fuselage with the two provided 1/4 - 20 nylon wing bolts. Make sure there are no wires trapped between the wing and the wing saddle of the fuselage. Place the stabilizer into the fairing slot at the rear of the fuselage. Note that the covering has been removed all the way to the trailing edge on the bottom of the stabilizer.

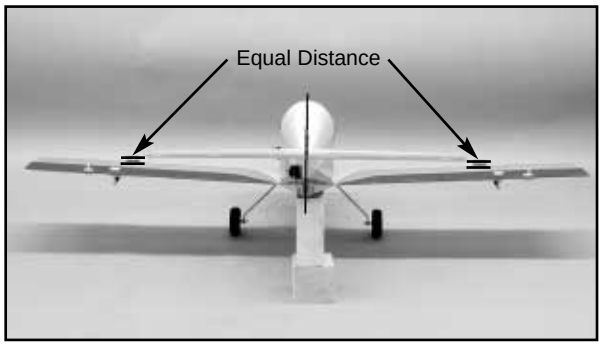


Carefully center the slot in the stabilizer to the vertical fin cutout in the top of the fuselage and align the stabilizer to the fuselage by measuring from the center of the firewall to the tip of the stabilizer at the hinge line. Make sure that both of these measurements are equal and pin in place.

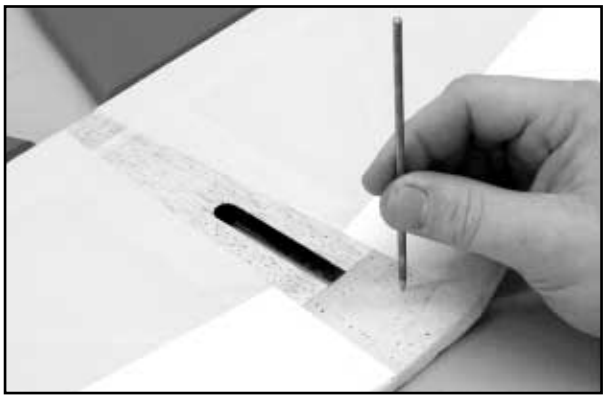


Carefully mark this position on the bottom and top of the stabilizer, then trim the covering to within 1/32" of your pencil marks to allow maximum surface for gluing.

Re-install the stabilizer, centering it visually and use a pin or two to hold it in place. Now step back and view the stabilizer in relationship to the fuselage and bottom wing. It should be square and aligned, without leaning to one side or the other. If it is, use a little sandpaper to adjust the stabilizer mounting plate until the stabilizer sits flat and square.

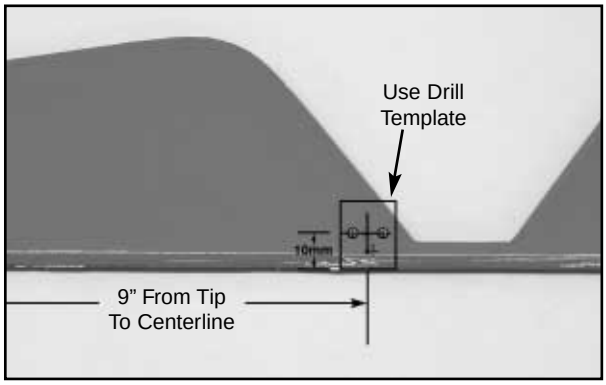


MODELER'S TIP: *Use a sharpened piece of music wire or an awl to perforate the mating surfaces of the stabilizer and the fuselage. These small holes or dimples allow epoxy glue to migrate into them, acting as small "nails" after the epoxy has cured.*



❑ 28) Using slow cure epoxy (15 or 30 minute type), apply glue to the exposed wood on the bottom center of the stabilizer and to the exposed wood on the top of the stabilizer. Also apply glue to the top and bottom wood in the fuselage stabilizer slot. Carefully slide the stabilizer into the slot. The slow cure epoxy allows plenty of time to now properly align the stabilizer to the fuselage. Again, measure from the center of the firewall to the tips of the stabilizer. View the airplane from the top, front and rear to make sure the stabilizer is square with the fuselage and leveled with the bottom wing. When satisfied, pin the stabilizer in place and wipe off any excess epoxy that may have oozed out with a paper towel and alcohol. Allow the glue to fully cure.

❑ 29) The elevator control horn is now mounted to the left inboard elevator half. Measure 9" in from the tip of the elevator on the bottom left side as shown. Use the Control Horn Drill Template to mark the mounting holes for the control horn. Drill the two required horn mounting holes with a 5/64" bit and bolt the control horn and backing plate in place with two M2 x 15mm screws and nuts.

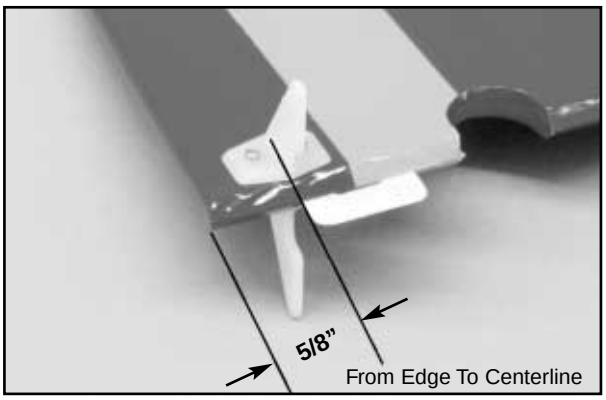


❑ 30) The elevator assembly is now hinged to the horizontal stabilizer, using the same hinging methods earlier used to hinge the ailerons.

FIN & RUDDER ASSEMBLY:

❑ 31) Trial-fit the vertical fin into the slot at the top rear of the fuselage, locating its bottom tab into the slot in the horizontal stabilizer. Mark the bottom of the fin, where the covering is to be removed to expose the wood for a good glue joint. Remove the fin and trim the covering about 1/32" inside these lines. Use slow cure epoxy to glue the fin into the slot, making sure the fin is 90° to the stabilizer and that its trailing edge lines up with the end edge of the fuselage. Use strips of masking tape to hold the fin in the correct 90° position to the horizontal stabilizer and allow the glue to fully cure.

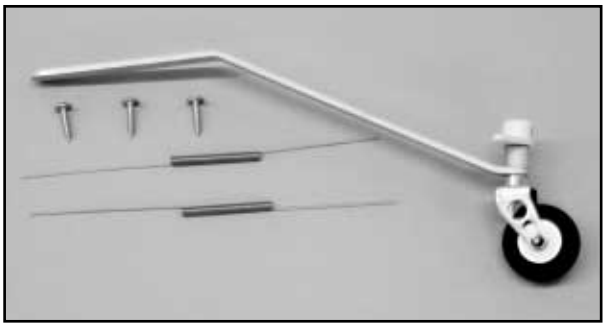
❑ 32) Measure up 5/8" from the bottom leading edge of the rudder and use the Control Horn Drill Template to locate the holes for the two rudder control horns. Since one of the bolts will pass through the hinge, insert the lower hinge into the slot before drilling the 5/64" dia. bolt holes.



Mount the two opposing nylon rudder control horns with two M2 x 15mm bolts and nuts. Locate the "T" bracket in the tail wheel assembly bag and mount it in place to the bottom of the rudder with two M2 x 10mm screws. Now insert the two remaining rudder hinges into the leading edge of the rudder and hinge the rudder permanently in place using the same methods described in the earlier aileron hinging directions.

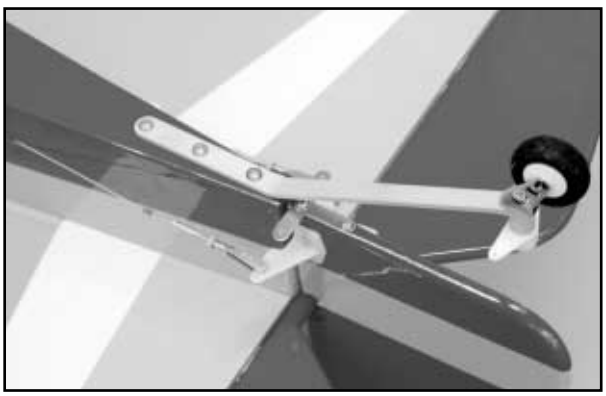
TAILWHEEL ASSEMBLY:

❑ 33) From your kit parts, locate the tail wheel assembly bag



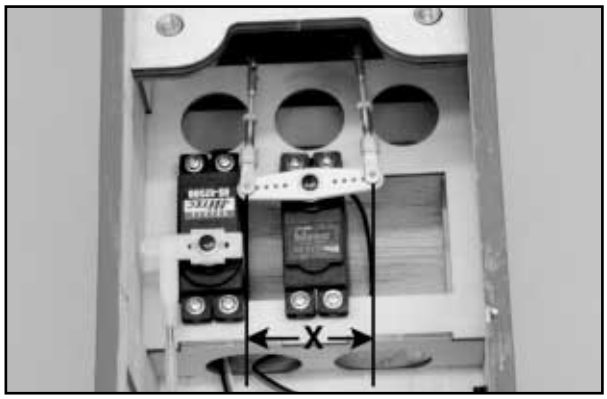
Hold the leaf spring in place onto the bottom rear of the fuselage. Align the spring along the centerline of the fuselage, with the bend about 1/8" forward of the rudder hinge line. Use a fine tip marker pen to mark the locations of the three mounting holes on the fuselage. Use a 1/16" dia. bit to drill the mounting holes through the bottom of the fuselage. Mount the leaf spring securely in place to the bottom of the fuselage, using the three M3 x 15mm PWA screws.

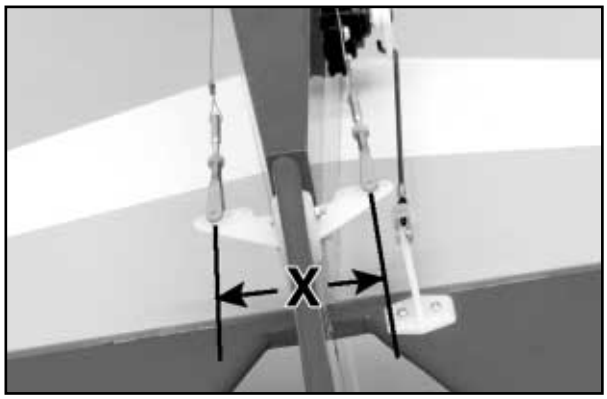
Note that the two tail wheel centering springs will be mounted in place after the pull-pull rudder cables are installed and centered in the following steps.



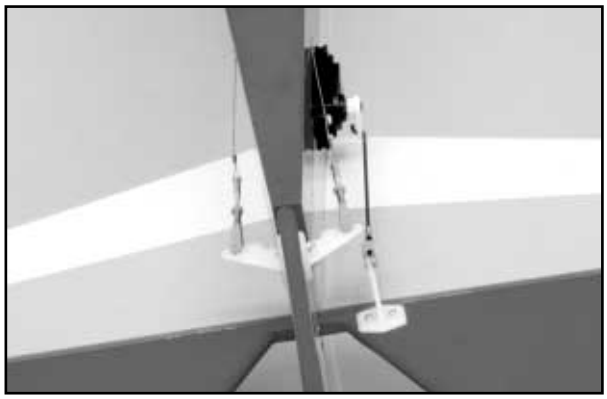
ASSEMBLING THE PULL-PULL CABLES:

Note: It is important that the distance between the pull-pull cable attach points at both the servo and rudder horns are as close to the same as possible.





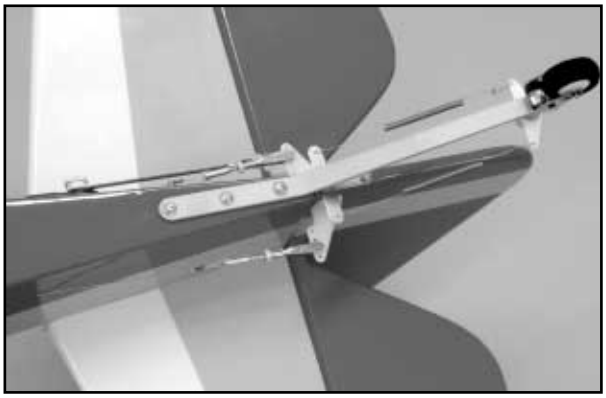
❑ 34) Use tape to hold the rudder in the neutral position. Prepare the two R/C links and the rigging couplers by first centering the R/C links in the middle of the threads of the rigging coupler. Then thread the knurled stop nut up snuggly against the R/C Link. Snap the R/C links and rigging couplers in place into the proper holes in each rudder control horn. Turn your radio system on and make sure the rudder servo arm is centered and that the rudder trim on the transmitter is also centered. Slip one of the copper swage tubes onto the end of the cable at the rear of the fuselage. Thread the end of the cable through the small hole in the end of the rigging coupler and take up the slack in the cable. Loop the end of the cable back and run it through the copper swaging tube and slide the swaging tube up to within 1/2" of the rigging coupler. Do not crimp the swaging tube at this time. Repeat this procedure for the remaining pull-pull cable. Next, with the rudder still taped in the neutral position, remove any excess slack from both of the pull-pull cables by pulling on the short end of the cable and sliding the swaging tube towards the rigging coupler. Use pliers or a crimping tool to squeeze the copper tube tightly over the cable to lock it in place. Cut off the excess short end of the cable and secure the joint with a small drop of thin CA glue, wicked into each swaging tube. Adjust the threaded R/C links until you get both pull-pull cables to approximately the same mild tension. It is not necessary to pull the cables extremely tight.



❑ 35) Remove the tape holding the rudder in place, turn on the radio system and test the movement direction and centering of the rudder. Make adjustments if needed. When satisfied with the operation of the pull-pull system, tighten the knurled stop nut on each rigging coupler up against the end of the R/C Links to lock the links in place.

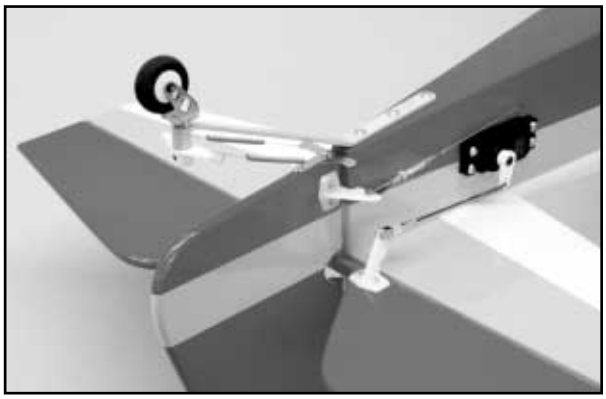
❑ 36) The two tail wheel centering springs are now installed. These springs connect the "T" bracket on the bottom of the rudder to the tail wheel steering arm, just above the tail wheel itself. These springs are installed and bent to impart just a little tension on the tail wheel bracket, centering the tail wheel with the rudder. Install the two springs making sure the tail wheel is centered with the rudder when it is in the neutral position.

Use needle nose pliers to bend loops in one end of the each spring and hook these loops into the holes of the metal "T" bracket on the bottom of the rudder. With the rudder and the tail wheel both in the neutral position, apply a small amount of tension to one of the springs and using pliers, make a 90° bend in the wire at the hole location on the tail wheel steering arm. Insert the wire into the steering arm and make another 90° bend back toward the center of the spring, forming a loop. Repeat this procedure with the remaining spring. Do not over stretch the springs when doing this. A little bit of tension is all you need. The springs should center the tail wheel to the rudder when it is at neutral. Turn on your radio system to check the movement of the rudder and tail wheel. If there is any binding, correct it. Finally, wrap several turns of the wire around itself to lock it into place and snip off the excess.



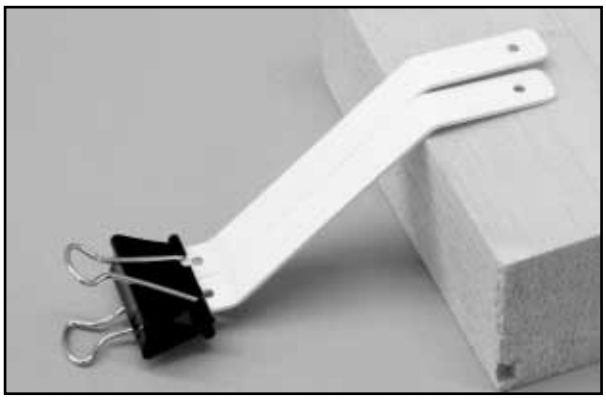
ELEVATOR PUSHROD:

❑ 37) Using your radio system, center the elevator servo making sure the trim lever is also centered. Mount the elevator servo output arm in place at 90° to the side of the servo, pointed up toward the bottom of the stabilizer. Use tape to hold the elevators in the neutral position to the horizontal stabilizer. Attach the Z-bend end of the pushrod into the servo output arm, using the second hole from the end of the arm. Adjust the threaded R/C link to fit into the last hole of the elevator horn. Remove the tape holding the elevators in neutral and test the movement of the elevators with your transmitter. Adjust the R/C link as required to get the elevators exactly at neutral.

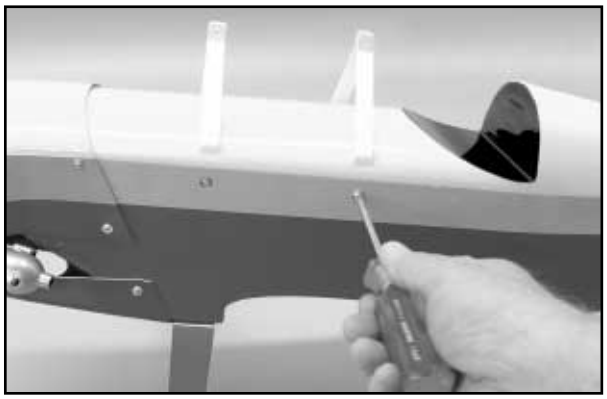


MOUNTING THE CABANE STRUTS:

❑ 38) From your parts bag, locate the bag containing the four factory painted aluminum cabane struts and mounting bolts. Carefully note that these are provided in two different lengths, as shown.



To achieve the proper incidence for the top wing it is important that these cabane struts are mounted in place correctly. The two longer cabane struts are bolted into the rear slot positions in the fuselage, using the provided M3 x 9mm PWA bolts. The two shorter cabane struts are mounted into the front fuselage cabane slots, using the two remaining bolts to secure them.



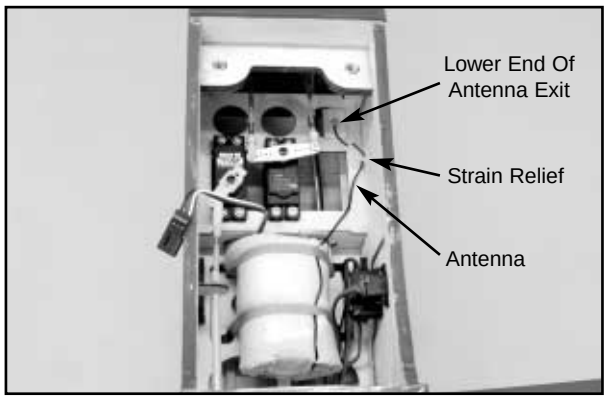
❑ 39) With the cabane struts now mounted, the windshield - removed earlier - is now reinstalled in front of the fuselage cockpit.

RADIO INSTALLATION:

❑ 40) The airborne battery pack is the single heaviest component of your radio system and this means that you can shift its final location as needed to achieve the correct balance point (Center of Gravity).). For reference, to achieve the correct C. G. location on our Sun Dancer 50 prototypes, we located the battery pack directly beneath the fuel tank. First wrap the battery pack in foam rubber and cover it with a small plastic bag before inserting it under the fuel tank. Use a little extra foam rubber as needed to keep the pack from shifting.

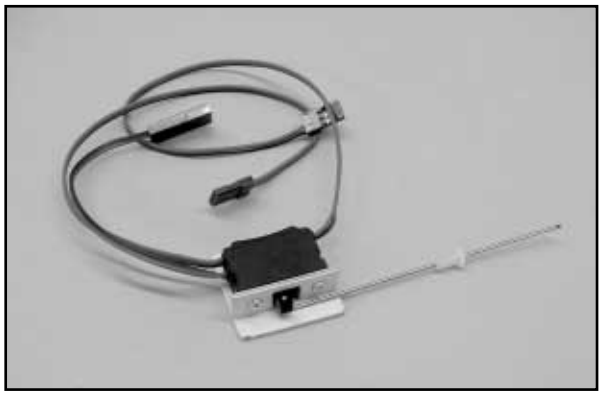
The receiver should also be wrapped in foam rubber. First make the required connections for the throttle, rudder, and elevator servos. Also install the Y-harness connector into the aileron receptacle. Wrap the receiver in foam rubber and mount it in place just ahead of the fuselage servo tray, using rubber bands to secure it. The two connectors from the Y-harness should be free and easily accessible.

Some radio systems (especially older systems) may be sensitive to the relationship of the receiver antenna running parallel with the braided metal cable pull-pull rudder system and/or the elevator servo extension cable. We, therefore, recommend that the antenna be routed outside of the fuselage, back to the top of the vertical fin. A neat way to do this is to use a piece of the inner throttle pushrod to make the exit mast as shown. The top of the tube extends about 1" above the fuselage behind the cockpit. The lower end of this tube extends slightly below the hole in the servo tray and is secured with a scrap of wood. The antenna is routed from the receiver to the lower end of the tube, up through the tube and then back to the top of the fin as shown. The antenna is attached to the top of the fin, under slight tension, with a rubber band that is looped around the antenna at one end and a pin in the fin on the other end.



The on/off switch can be mounted directly into the side of the fuselage or internally, using piece of music wire as the means to activate the switch. We typically prefer an internally mounted switch simply because it is cosmetically clean and keeps fuel and dust out of the switch mechanism. To do this, we made a simple mounting bracket from scrap 1/8" plywood that was made to fit inside the fuselage. Our switch was then mounted onto the bracket with a short length of .045" music wire from the switch lever to the outside

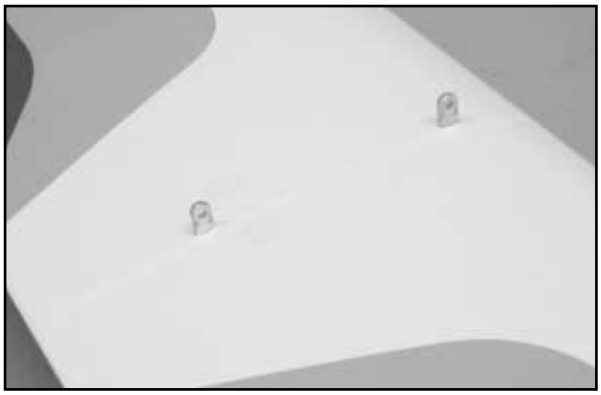
of the fuselage to turn the system on and off. This is actually quite simple to do. First drill a small diameter hole in the switch lever to fit a piece of .045" dia. music wire. Drill an exit hole in the side of the fuselage, lined up with the switch/wire location. Make a 90° bend in one end of the wire and insert the short end into the hole in the switch lever. Insert the wire through the hole in the fuselage and make another 90° bend in the wire, outside of the fuselage side, giving you a small "handle" to pull and push when activating the on/off switch. Besides looking neat, your switch is now protected from the elements.



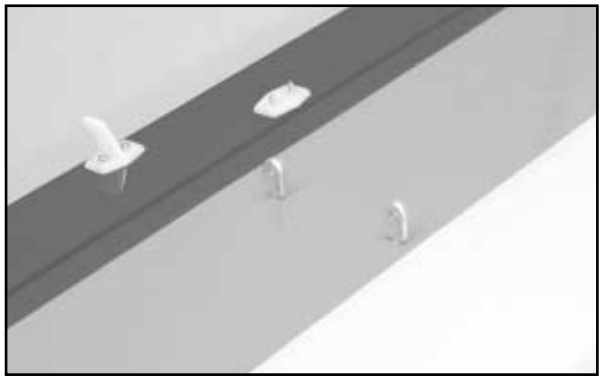
MODELER'S TIP: To give your model that professional look, use a rubber powered nose bearing from Peck Polymers (Part Number 006) as an exit guide for the switch wire, where it passes through the fuselage side. This gives the whole thing a very nice, finished look.

FINAL ASSEMBLY:

❑ 41) Locate the parts bag containing the ten (10) aluminum strut attach fittings. Two of these fittings are now installed into the two pre-drilled holes on the bottom center surface of the top wing. Screw each fitting in place until the bottom of the fitting just touches the bottom surface of the wing. Now turn the fittings back out one full turn until their mounting holes squarely face each wing tip.



The remaining eight (8) aluminum strut fittings are now installed at the outer pre-drilled holes on the bottom of the top wing (4 required) and the top surface of the bottom wing (4 required). Just as described, screw these fittings in place until their mounting lugs contact the surface of the wing and then back them out one full turn to orient their mounting holes toward the wing tips, parallel to the wing span.



❑ 42) Install the bottom wing to the fuselage using the 1/4-20 x 1-1/2" nylon bolts. Take care that the aileron servo wires are not caught between the wing and the wing saddle of the fuselage. Attach the top wing to the fuselage by inserting the strut fittings on the bottom center of the wing into the space between the cabane struts on the fuselage. Line up the holes in the strut fittings with the holes in the cabane struts and secure the wing in place with the provided M3 x 10mm PWA bolts and 3mm lock nuts. Do not install the interplane struts at this time.

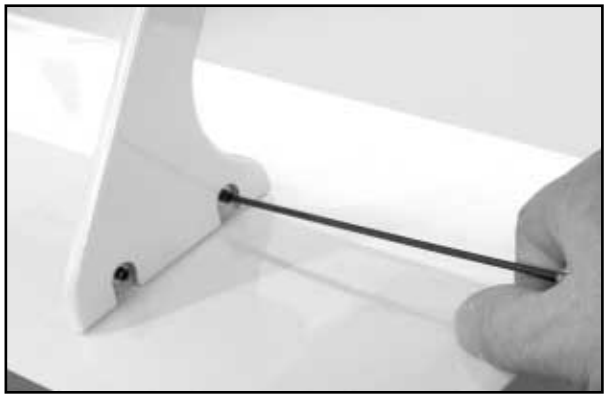
❑ 43) Because the Sun Dancer 50 is a biplane configuration, the incidence of the wings is twice as critical and therefore must be properly set up to achieve its full flight performance potential. The following steps require the use of an "incidence meter" to properly align the wings. Do not attempt to set up this model without the use of a good incidence meter.

a) Place the incidence meter on the lower wing, and then block up the back of the fuselage until the incidence meter reads 0° of incidence.

b) Remove the incidence meter and move it up to the center of the top wing. View the top wing from the front to make sure it is at or very close to horizontal (level). With the top wing in this position,

the incidence meter should read 0° of incidence. If it does not read 0°, adjust the center aluminum strut fittings - screwing them in or out - as needed until the incidence meter reads 0°.

❑ 44) The two outer interplane wing struts are now mounted in place. Before these struts can be bolted in place, you must first align their pre-drilled holes in the top and bottom of the struts with the holes in the aluminum strut fittings. Adjust these fittings in or out until the interplane strut can be bolted in place without applying any pressure to the wing or strut to align their holes. In addition, use a ruler to check and make sure that the top and bottom wings are the same distance apart at the wing tips. Bolt the interplane struts in place with the eight (8) provided M3 x 10mm PWA bolts.



❑ 45) Use the incidence meter to now measure the incidence of the four wing panels at the inboard ends of each aileron. Again, the incidence meter should read 0° of incidence at each location. If the meter reads anything other than 0° then we have to find the problem before flying the model. The most likely place to start is by unbolting the interplane struts to see if a warp was induced when the interplane struts were attached. Highly unlikely but possible is a warped wing from the factory. The wings are built and covered in jigs at the factory and checked for warps before they are packaged and shipped. If a warp is discovered, it can be easily corrected. Twist the wing panel in the opposite direction of the warp and carefully re-shrink the covering material on the appropriate side of the wing panel. Continue holding the opposite twist in the wing until the covering cools. You may have to repeat this procedure until the warp is completely removed.

❑ 46) The two 2mm x 165mm aileron inter-connect drive wires are now installed to drive the upper ailerons from the lower ailerons. Use tape to hold the two upper ailerons in the neutral position. Insert the Z-bend end of the inter-aileron drive wire into the nylon inter-connect horn on the upper aileron. Turn the radio system on. Thread the R/C link on the lower end of the rod up or down as needed to fit easily into the hole in the nylon inter-connect horn on the lower wing. Once satisfied, tighten the lock nut behind the R/C link to lock the R/C link in this adjustment position. Repeat this process on the opposite set of ailerons. Remove the tape holding the upper ailerons centered and use the transmitter to check for movement and centering of the now coupled ailerons.

CONTROL MOVEMENTS:

This is an important section of this manual. After flying your SUN DANCER 50 for a while and getting used to its characteristics, you may wish to adjust the control throws to better suit your flying style. But you have to start somewhere and this is where you begin. These movements provided the SUN DANCER 50 with very smooth control inputs without the immediate need for exponential. We suggest starting out with these movements. You can easily play with more control throw after you become comfortable with the airplane. In the case of the elevators and rudder, control movements are always measured at the widest point of the control surface.

SUGGESTED CONTROL SURFACE THROWS

Ailerons:	3/8" Up – 3/8" Down
Elevators:	5/8" Up – 5/8" Down
Rudder:	3/4" Left – 3/4" Right

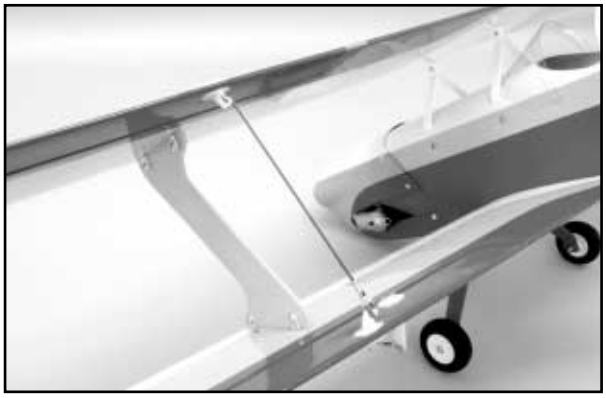
IMPORTANT: The control surfaces of your Sun Dancer 50 provide very positive control response. We strongly recommend you do not exceed these recommended throws on the first flight.

DECAL APPLICATION:

The decals provided with this kit are typical markings that might be seen on a full size aerobatic airplane. They are not intended to be a complete set of markings to duplicate any particular full size aircraft. However, they look very realistic and believable when in place. Use the various box art and assembly manual photos to position the decals in the appropriate locations on your model. Feel free to use all or only some of the decals in different locations as you see fit.

These decals are made from adhesive-backed Mylar™ - they are NOT water-activated transfers. These decals are not die-cut and must be cut from their sheets with a sharp #11 blade or scissors. Trim as close to the image as possible.

We suggest the following procedure to accurately and neatly apply the larger decals in this kit. Carefully cut out the decal and lift it off of the sheet with tweezers. Use a product like SIG Pure Magic Model Airplane Cleaner or Windex® to spray the general area of the model that will receive the decal. Then spray the adhesive side of the decal as well. Lightly position the decal in place on the model. The liquid cleaner allows the decal to slide easily into the



desired position as long as you don't press down on it. Once the decal is in position, hold it lightly in place with your fingertips and use a paper towel to gently dab the excess liquid away. Use a small squeegee to now set the decal in place, removing all excess liquid and any trapped air bubbles from beneath the decal. The SIG 4" Epoxy Spreader - #SIGSH678 - is perfect for this job. Remove any excess fluid with a dry paper towel and allow the decals to set overnight. They will be solidly adhered to the model without any air bubbles.

CENTER OF GRAVITY:

In terms of the flight characteristics you will realize, this is probably the single most important step in preparing your SUN DANCER 50 for flight. The final placement of the longitudinal Center of Gravity or Balance Point is extremely important and should be approached with patience and care. Completely assemble the model, including propeller, spinner, etc. Do not leave anything off the airplane that will be on it in flight. DO NOT FILL THE FUEL TANK for balancing purposes.

We have found that the simplest way to check the balance is the old "fingertips under the top wing" method. First place a strip of masking tape on the bottom side of the top wing on both sides of the cabane struts. Measure back from the leading edge and place marks on the masking tape at the distance shown below.

For initial test flying and familiarization purposes, we suggest a starting balance point of 3-1/4" behind the leading edge of the top wing.

Place your fingers on the rear marks on the tape and gently lift the model up off the workbench. If the model hangs in a tail low position, the airplane is tail heavy. If the model hangs nose low, it is nose heavy. If the model hangs level at the 3-1/4" mark, the model is balanced properly for initial test flights.

If you need to move your balance point fore or aft slightly, the first method to try is relocating the airborne battery pack. Often times, moving your battery pack fore or aft is all you need to do to achieve the desired balance point. If you have a super heavy engine, it's not unheard of for the battery pack to end up behind the cockpit area. Wherever the battery pack ends up, be sure it is adequately secured to the model structure so it will not move around in flight. If relocating your battery pack is not enough to achieve the desired balance point, and more weight is needed, consider using a larger (and therefore heavier) battery pack. Try to avoid adding useless weight. If you need more weight in the nose, try a heavier spinner or replace the light wheels with heavier after-market wheels. If your model is nose heavy and battery shifting does not work, you can make significant changes in balance with stick-on lead weights. These can be used temporarily on the outside of the model until you've flown the airplane sufficiently to know exactly where you like the CG and how much weight it takes to get it there. Once that's done, the lead weights can be placed inside the fuselage by simply removing the elevator servo and securing the weights on the inside. With the elevator servo back in place, the weights are hidden.

After flying for a while you may wish to fine tune the balance point to match your flying style. As we all know, as the balance point is moved aft, an airplane will become more responsive in all axis, but it will be especially noticeable in "pitch" (up and down). We have flown the SUN DANCER 50 with the C.G. as far back as 3-5/8" and found it to be manageable, with excellent aerobatic capabilities. However, we did notice an increase in pitch sensitivity and had to decrease the elevator throw to compensate. "Softening" elevator response with a reasonable exponential percentage also works. In the end, the final balance point and control throws you use will depend somewhat on how you like to fly. Some pilots like their models extremely reactive, others strive for more smoothness. The SUN DANCER 50 is a very capable aerobatic machine and can be tailored to fit your style. We therefore suggest that you begin with the suggested C.G. location and experiment from there.

Finally, the aerobatic performance of your SUN DANCER 50 will benefit greatly if you balance the airplane laterally as well as fore and aft. In other words, eliminate the "heavy wingtip" syndrome. Lateral balancing requires that the model be suspended upside down by two lines (use substantial size chord or fishing line). Loop one line over the engine propeller shaft and the other line over the tail wheel bracket. Hang the model from the ceiling or a rafter, leveling it in side view. With the model secured in this way, observe the wings. Ideally they should be level, without one wing lower than the other. If one wing panel is lower, it means that it is somewhat heavier than the other. When flying the model, this imbalance can cause the model to "pull" to the heavy side, especially in loops and up line maneuvers. To make the airplane track true, the light wing panel needs weight at the tip to balance it level with the other panel. Again, this can be done with stick-on weights, which could later be hidden inside the wingtip.

FLYING:

If you have carefully followed this assembly manual, you should have no real problems in test flying your SUN DANCER 50. Try to choose a calm day for the first flight. Good conditions will help in correctly evaluating the flight performance of the model. Begin your test flight by making sure the engine is properly broken-in, with a reliable idle, a strong top end, and smooth transition performance. Set your engine's high-speed needle valve a little on the rich side, so that when the airplane noses up the engine will not be over lean and sag.

Holding up elevator, taxi the model to get a feel for how it handles on the ground. Make sure you have positive left and right turning ability. If not, make any adjustments needed to achieve positive ground control. Once you are satisfied with the taxi tests, line the model up with the centerline of the runway with the nose into the wind. Hold a little up elevator and advance the throttle smoothly - do not throw the throttle open all at once! The airplane should roll forward smoothly. As speed builds, slowly back off the elevators and use just a little rudder, only as needed, to maintain a straight takeoff run. The tail will come up as flying speed is reached and a little up elevator will lift the SUN DANCER 50 off the ground.

Maintain a straight outbound flight path, climbing at a shallow angle until a safe maneuvering altitude is reached. If the model requires trim, fly it to a reasonable altitude first before trimming. Initially, make your control inputs smooth and avoid jerking the sticks.

At altitude, make any trim changes needed to achieve hands off, straight and level flight. From our experience, this will take very little trim input, if the model was assembled and balanced properly. Once you're comfortable, make a few circuits around the field to get the feel of the controls. The airplane should demonstrate smooth flight characteristics without jumpiness or over-sensitivity. At altitude, try a roll. Then, try another roll to the opposite side. Properly trimmed, the SUN DANCER 50 will roll smoothly and very axially in either direction. Now try a loop. The SUN DANCER 50 should pull cleanly through loops, without wandering to either side. Once you're comfortable, try knife-edge flight. You will quickly find that the SUN DANCER 50 easily

maintains altitude with just a little rudder input! You will also discover that your SUN DANCER 50 has outstanding inverted flight characteristics. Our prototypes require only the smallest amount of down elevator to maintain level inverted flight!

Assuming you're comfortable and getting used to the airplane, take it to a safe altitude and throttle back to get a feel for the slow flight and stall characteristics. Properly balanced and trimmed, your SUN DANCER 50 should demonstrate fairly sedate, no fuss stall characteristics. Once flying speed is bled off and full up elevator input is reached, the SUN DANCER 50 should just drop its nose and resume flying as speed picks up. All of this is great information to have when you are setting up the first landing.

Landing the SUN DANCER 50 is a pleasure. We like to keep a little power on the engine during final approach, down to a few feet off the ground. Back completely off the throttle once the airplane is low to the ground with a good rate of descent established. Flair the airplane as the ground approaches for a smooth 3-point landing and rollout. Hard landings are not necessary, sound piloting skills are.

The second flight should be even more fun because you have now inputted any required trim changes learned from the first flight. Before flying again, check the airplane for anything that may have come loose, become disconnected, etc. This is good practice and tends to insure a long life for the model.

As you become more familiar with your SUN DANCER 50, you'll discover its ability to perform some very nice aerobatics. The SUN DANCER 50 is an elegant aerobatic machine with seemingly endless capabilities.

We hope you will enjoy your SUN DANCER 50 for a long time to come. Please fly the model safely with constant regard to other fliers, spectators, and property.

Good Luck and Good Flying!

SUN DANCER 50 ARF LOG BOOK

Date of first flight:

Comments:

SUN DANCER 50 ARF LOG BOOK

Date of first flight:

Comments:

WARNING! THIS IS NOT A TOY!

Flying machines of any form, either model-size or full-size, are not toys! Because of the speeds that airplanes must achieve in order to fly, they are capable of causing serious bodily harm and property damage if they crash. **IT IS YOUR RESPONSIBILITY AND YOURS ALONE** to assemble this model airplane correctly according to the plans and instructions, to ground test the finished model before each flight to make sure it is completely airworthy, and to always fly your model in a safe location and in a safe manner. The first test flights should only be made by an experienced R/C flyer, familiar with high performance R/C aircraft.

The governing body for radio-control model airplanes in the United States is the **ACADEMY OF MODEL AERONAUTICS,** commonly called the **AMA**. The **AMA SAFETY CODE** provides guidelines for the safe operation of R/C model airplanes. While AMA membership is not necessarily mandatory, it is required by most R/C flying clubs in the U.S. and provides you with important liability insurance in case your R/C model should ever cause serious property damage or personal injury to someone else. For more information, contact:

ACADEMY OF MODEL AERONAUTICS
5161 East Memorial Drive
Muncie, IN 47302
Telephone: (765) 287-1256

AMA WEBSITE: www.modelaircraft.org

CUSTOMER SERVICE

SIG MANUFACTURING COMPANY, INC. is committed to your success in both assembling and flying the SUN DANCER 50 ARF kit. Should you encounter any problem building this kit, or discover any missing or damaged parts, please feel free to contact us by mail or telephone.

SIG MANUFACTURING COMPANY, INC.
P. O. Box 520
Montezuma, IA 50171-0520

SIG MODELER'S ORDERLINE: 1-641-623-5154
(to order parts)

SIG MODELER'S HOTLINE: 1-641-623-0215
(for technical support)

SIG WEB SITE: www.sigmfg.com

LIMIT OF LIABILITY

The craftsmanship, attention to detail, and actions of the builder/flyer of this model airplane kit will ultimately determine the airworthiness, flight performance, and safety of the finished model. SIG MFG. CO.'s obligation shall be to replace those parts of the kit proven to be defective or missing. The user shall determine the suitability of the product for his or her intended use and shall assume all risk and liability in connection therewith.

WANT MORE "Fun In The Sky" EXCITEMENT?

SIG MANUFACTURING COMPANY, INC.
P.O. Box 520 • Montezuma, Iowa 50171-0520
Web Site: www.sigmfg.com • Phone: (641)623-5154

Somethin' Extra® ARF
Order No. #SIGRC76ARF

Mayhem 40 ARF
Order No. #SIGRC98ARF

If you enjoy the aerobatic performance of the SIG Sun Dancer 50 ARF, check out these other high performance models from SIG. The Mayhem 40 ARF is a 3-D capable performance machine with the ability of extreme maneuvers to really test your flying skills. The Somethin' Extra® ARF is the perfect Sunday airplane - still capable of great performance but easy to land with no bad habits. Or, go for scale appearance and performance with the Extra 300XS ARF and simulate the maneuvers yourself that you are likely to see the real Extra 300XS perform at a major air show. Three more great models to grow with from SIG.

Extra 300XS ARF
Order No. #SIGRC78ARF

Champion 4-Stroke
10 & 15% Nitro
16% Lubrication

Champion All Caster
5, 10, & 15% Nitro
20 & 25% Castor

Terminator 2000
10 & 15% Nitro
18% Lubricants

Champion 2-Stroke
FAI, 5, 10, 15, 25, & 35% Nitro
20% Lubricants

Syn Plus
5, 10, & 15% Nitro
SIG-7™

Champion Helicopter
15 & 30% Nitro
22 & 24% Lubricants

Tiger Blend & Big Bore
10% Nitro
10 & 12% Lubricants

4-Stroke Synthetic
10 & 15% Nitro
18% Lubricants

Why Take Chances?

Two things mark the difference between a great day at the field and disaster. One is your radio batteries. Second is your fuel.

Having the right fuel for your glow engine is as simple as making sure the SIG label is on your bottle. Each gallon of SIG fuel is custom blended in our own fuel production facility, insuring freshness and consistency time after time.

Only the highest quality ingredients go into SIG fuel. Ingredients like 99.9% pure methanol, racing quality nitromethane, top of the line castor oil, and premium Klotz racing lubricants. All are specially blended to withstand the rigors of today's two and four stroke model engines.

With over thirty-five different blends, you'll find the formula right for your engine and your flying style. Each gallon is clearly marked with the nitro and oil content, taking the guesswork out of flying.

So why take chances. Go with the fuel flown by Champions for years.