

# ***SUPER*** **STICK**

## INSTRUCTION MANUAL

- **Specifications for .40**  
Wingspan: 52-3/4"  
Length: 48"  
Wing Area: 593 sq. in.  
Weight (Approx): 5 – 5.5 lbs.  
Recommended Engines:  
.40 – .46 2-Cycle  
.50 – .56 4-Cycle

- **Specifications for .60**  
Wingspan: 59"  
Length: 54"  
Wing Area: 738 sq. in.  
Weight (Approx): 7.25 – 7.75 lbs.  
Recommended Engines:  
.61 – .75 2-Cycle  
.65 – .80 4-Cycle



- 90% Pre-Built
- Build as Tail dragger or Tricycle Landing Gear System
- All Hardware Included

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## INTRODUCTION

Congratulations on purchasing the Hangar 9 Super Stick. This is the ideal second airplane for modelers capable of flying a trainer-type aircraft. In a few short evenings, this 90% pre-built aircraft will be ready for its debut at the flying field.

This manual has been written to ensure that you achieve the best performance and maximum enjoyment from your Super Stick. It is important to carefully read and follow the instructions in this manual prior to flying.

## WARNING

An R/C aircraft is not a toy! If misused, it can cause serious bodily harm and damage to property. Fly only in open areas, preferably AMA (Academy of Model Aeronautics) approved flying sites, following all instructions included with your radio and engine.

## ADDITIONAL EQUIPMENT REQUIRED

### ► Equipment Needed

4 Channel Transmitter (minimum)  
5 Standard Servos  
Standard 450–650 mAh Receiver Battery Pack  
2 Aileron Extensions and/or 1 Y-harness

- **Note:** If more than a 4-channel radio is used, than Y-harness is not necessary.



### ► Recommended JR Systems

JR F400 FM (Optional Y-harness required)  
JR XF642FM  
JR XP783  
JR XP8103  
(5 servos required)

### ► Engine Recommendations

Super Stick 40:  
.40–.46 2-Cycle Engines  
.45–.56 4-Cycle Engines

Super Stick 60:  
.61–.75 2-Cycle Engines  
.65–.80 4-Cycle Engines



Thunder Tiger .40



Thunder Tiger .61



Saito .50



Saito .65

### ► Recommended 2-Cycle Engines

Super Stick 40:  
Thunder Tiger Pro .40  
Thunder Tiger Pro .46  
Thunder Tiger .42 Sport  
Webra Speed .40 Sport

Super Stick 60:  
Thunder Tiger Pro .60  
ASP .61  
ASP .75

### ► Recommended 4-Cycle Engines

Super Stick 40:  
Saito .50  
Saito .50GK  
Saito .56  
Saito .56GK

Super Stick 60:  
Saito .65  
Saito .65GK  
Saito .80  
Saito .80GK

## TOOLS AND SUPPLIES REQUIRED

### ► Adhesives

Thick CA (cyanoacrylate) glue  
6-minute epoxy  
30-minute epoxy  
Blue Locktite 242

### ► Tools

Drill  
Drill bits:  
1/16", 3/32", 5/32"  
Phillips screwdrivers  
Z-bend pliers  
Pliers  
Small round file  
Moto-tool  
with sanding drum  
Hobby knife  
with #11 blade  
Mixing stick  
Epoxy brush

Medium sandpaper  
Masking tape  
Straight edge  
Measuring devices  
(ruler, tape measure,  
90° triangle)  
Scissors  
Paper towels  
Wax paper  
Rubbing alcohol  
Felt tipped pen  
Fuel tubing  
Clips (clothes pins,  
binders)

## CONTENTS OF KIT



### ► Covered Parts

Fuselage

Left wing half with aileron

Right wing half with aileron

Vertical stabilizer with rudder

Horizontal stabilizer with elevator



### ► Small Parts

Pushrod and Accessories

1/8" plywood die-cut parts

Main landing gear

Nose landing gear

Spinner

Hardware bag

Plastic parts tree

Foam wheels (3)

Fuel tank and hardware

Tail wheel assembly

Landing gear block

## FIELD EQUIPMENT REQUIRED



Airplane Fuel



12V Starter



Propeller



Glow Driver



Glow Plug



Manual Fuel Pump



12V Sealed Battery



Glow Plug Wrench

## OPTIONAL FIELD EQUIPMENT



4-Way Wrench



Field Box



Cleaner & Towels



Extra Glow Plugs



Misc. Tools



After-Run Fuel



Power Panel

# 1

## ASSEMBLING THE WINGS

### ► Parts Needed

Right wing panel with aileron & hinges  
Left wing panel with aileron & hinges

### ► Tools & Adhesives Needed

30-minute epoxy  
Paper towels  
Rubbing alcohol  
Mixing stick  
Epoxy brush  
Ruler

- **Note:** The ailerons are attached to the wing halves from the factory, but the hinges are **not** glued in place. The right aileron must go with the right wing half and the left aileron must go with the left wing half. Be sure to mark the aileron for correct identification and top and bottom before you take it apart from the wing.

1. Carefully remove the aileron from the right wing panel by pulling straight out with even pressure.
2. Remove all four hinges from the aileron. Flex the hinges accordingly so that they move freely.
3. Mix a small amount of 30-minute epoxy. Using either a mixing stick or an epoxy brush, apply the epoxy sparingly inside each hinge slot on the aileron. Additionally, apply a small amount of epoxy to the top and bottom half of each hinge. Insert the hinges into the aileron accordingly until the hinge line is even with the leading edge of the aileron.



4. Wipe off any excess epoxy using a paper towel and rubbing alcohol.

- **Hint:** Lightly coat both ends of the ailerons with epoxy, if they don't have covering on them; this will prevent the ailerons from becoming fuel-soaked. You can mix a small amount of rubbing alcohol (one part alcohol to three parts epoxy) into the epoxy to thin it. This will make for a thinner coat of epoxy which prevents a thick build-up on the ends of the ailerons. This is a common way to "fuel proof" bare wood.



5. The bolt holes on each wing half are pre-drilled. Locate the holes that are under the covering and carefully cut-out the covering with your hobby knife. Lightly coat the inside of the holes with your thinned epoxy. Only use just enough to have a thin coat. Too much will not allow the wing bolts to pass through.





# 1

## ASSEMBLING THE WINGS continued

- Mix a small amount of 30-minute epoxy to install the aileron with affixed hinges onto the wing half. Apply epoxy to the top and bottom of the remaining half of each hinge. Using either a mixing stick or an epoxy brush, apply epoxy inside each hinge slot on the wing.
- Replace the aileron on the right wing half, ensuring that the hinges are properly aligned. The gap between the aileron and the wing should remain a constant 1/16", or as tight as possible so the movement of the aileron is not impaired.



- Carefully wipe off any excess epoxy using a paper towel and rubbing alcohol.
- Repeat the procedures above for the left wing half.
- Allow the epoxy to fully cure before proceeding to the next section.

# 2

## JOINING WING HALVES

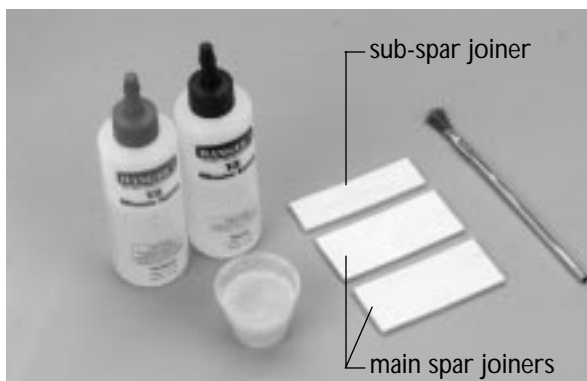
### ► Parts Needed

Right wing panel from Section 1  
 Left wing panel from Section 1  
 2 main joiners  
 1 sub spar joiner  
 Wing center tape

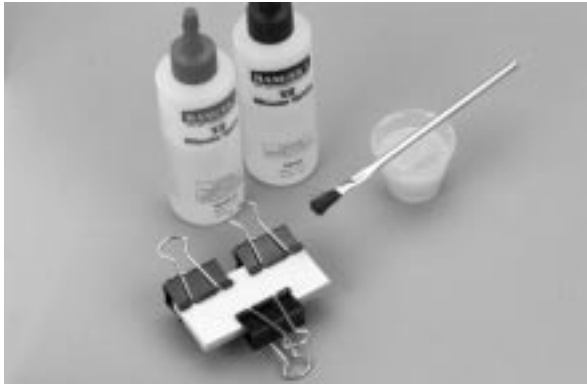
### ► Tools & Adhesives Needed

6-minute epoxy	String
30-minute epoxy	Wax paper
Clips (e.g., clothespins, binder clips)	Ruler
Rubbing alcohol	Pencil
Paper towels	Medium sandpaper
Masking tape	Mixing stick
Hobby knife	Epoxy brush
	Felt tipped pen

- Carefully remove the three individual spar joiners from the die-cut plywood sheet. Two of the spar joiners are the same size and one is smaller. The two larger pieces are the main spar joiners. The smaller one of the three is the sub-spar joiner.
- Mix a small amount, approximately 1/4 ounce, of 6-minute epoxy. Using either a mixing stick or epoxy brush, apply the epoxy to one side of **one** of the main spar joiners. Place the epoxied spar joiner on top of the remaining main spar joiner. Align the upper and lower edges of the spar joiners as well as the area which has the slight "V" shape.



- Clamp the two spar joiners together using three clothespins or clips. Ensure that the joiners remain aligned and that the clamps are firmly attached.



- Wipe away the excess epoxy using a paper towel and rubbing alcohol, being careful not to disturb the alignment of the wing joiners.

- **Note:** The excess epoxy should be removed before it cures.

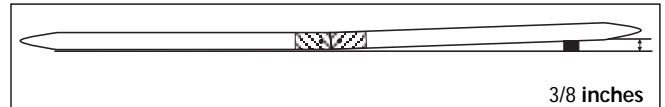


- Allow the epoxy to cure completely prior to removing the clamps.
- Trial fit the main spar and the sub-spar joiner into one of the wing panels. It should insert easily. Now slide the other wing half onto the main spar joiner and sub-spar until the wing panels meet.

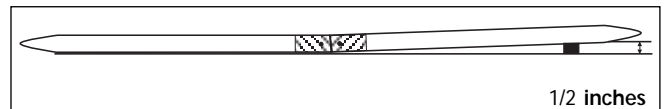


- Check for the correct dihedral angle. Place the wing on a large, flat surface with one wing panel resting on the surface. The opposite wing tip should be exactly 3/8" (for .40) or 1/2" (for .60) from the surface (see illustrations below). If necessary, sand the main spar joiner and sub-spar until this is achieved.

.40 size



.60 size



- Before final assembly of the wing halves, it is now a good time to install a method of pulling through your aileron servo wires. Locate on each wing half the location of the servo. You will be able to identify this by a solid square shape with a rectangle cut-out in the center of the wing half under the covering that is roughly the size of the bottom of your servo. Take your hobby knife, with a sharp blade, and cut-out the covering where the servo will be installed. You do not need to install the servos and servo extensions at this time, this is simply a method to pull them through the wing when needed.



- **Hint:** You can feed music wire or an extra pushrod that you may have around (or take a coat hanger and straighten it) through the pre-cut root rib opening (the end were the spar joiners are located). Carefully insert it inside the wing half and through each of the pre-cut openings of the wing ribs until it is at the opening for the servo (reach inside the servo opening to retrieve). Tape a piece of string to it and carefully pull it through, leaving both ends accessible (a shoe string works well for this). Now take a piece of tape and tape the ends of the string to the wing half. Do this to both wing halves.



9. Mix up approximately three ounces of 30-minute epoxy.
- **Note:** When joining the wing halves, it is extremely important to use plenty of epoxy.
10. Use a mixing stick or scrap piece of wood to apply a generous amount of epoxy into the main and sub-spar joiner cavity of one wing half. Ensure that the epoxy is applied to all sides of the cavity wall.



11. Coat one half of the spar joiners with epoxy. Install the epoxy-coated side of the spar joiners into the spar joiner cavity. Be sure to install the joiners all the way into the spar cavity. Make sure the "V" is positioned correctly, so that it creates positive dihedral in the wing.



12. Apply a generous amount of epoxy into the joiner cavity of the other wing half.



13. Smear epoxy on all sides of the exposed area of the spar joiners and uniformly coat both wing roots with epoxy.

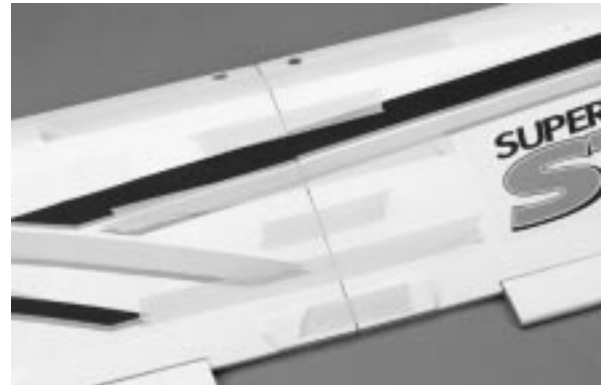


14. Carefully slide the two wing halves together ensuring that they are accurately aligned. Firmly press the two halves together, allowing the excess epoxy to run out. Using rubbing alcohol and a paper towel, clean off the excess epoxy. There should not be any gap between the wing halves.



15. Apply masking tape to hold the wing together securely while the epoxy cures. Place the wing on a large, flat surface. With one wing panel lying flat on the surface, the opposite wing tip should be propped up exactly  $\frac{3}{8}$ " (for .40 size) or  $\frac{1}{2}$ " (for .60 size) from the surface. Allow the wing joint to dry overnight.

- **Note:** It is a good idea to place a sheet of waxed paper under the center joint of the wing so that any excess epoxy will not adhere to the surface of the work area.



16. When the wing center joint is completely dry, remove the masking tape and apply the included trim tape to cover the center joint. Be really careful to match the stripes on the wing center tape to the stripes on top of the wing.



# 3

## INSTALLING THE AILERON SERVOS

### ► Parts Needed

Assemble wing  
2 standard size servos with mounting hardware  
2 servo extensions (6" or 9")

### ► Tools & Adhesives Needed

Hobby knife  
Masking tape

1. Install the recommended servo hardware supplied with your radio system onto your servos (grommets and eyelets). Install a minimum 6" servo extension onto each of your aileron servos.

► **Hint:** It is always good procedure to tape the extension connector and the servo lead connector together to insure that they will not become unplugged inside the wing.

2. With the servo extension securely fastened to the servo lead, tape the end of the servo extension to the string you installed onto the end that exits where the servo will be installed.



3. Carefully pull the string through the wing until you have the servo extension plug exit at the center of the wing at the wing root.

4. Install the servo into the aileron servo slot.

► **Note:** It does not matter which way the servo is installed into the slot; in other words, if the servo horn is closer to the aileron.



5. Securely fasten the servo in the aileron slot with four of the servo mounting screws supplied with your radio system.



6. Follow steps 1 – 5 for the other aileron servo.

# 4

## BOLT WING TO FUSELAGE

### ► Parts Needed

Fuselage  
4 wing bolts & washers

### ► Tools & Adhesives Needed

Hobby knife or round file  
Phillips screwdriver

► **Note:** Your Hangar 9 Super Stick comes from the factory with pre-installed blind nuts in the fuselage and pre-drilled holes in the wing for bolting the wing to the fuselage.

1. Place the wing onto the wing saddle of the fuselage, approximately aligning the wing center with the center line of fuselage.



2. Insert each of the wing bolts into the wing.

3. Carefully thread each bolt just a few turns into the installed blind nuts of the fuselage.

► **Note:** If the wing bolts are not perfectly aligned and you can't get bolts to thread into the blind nuts, carefully use a round file and enlarge the pre-drilled hole in the wing on the bolt hole that is not exactly aligned. If you have to do this, it only requires that a slight amount of material be removed. The wing bolts may be hard to turn when you first install them, but it will get easier in time. Be careful not to cross-thread the bolts into the blind nuts.

4. After each wing bolt is started, tighten each bolt a little at a time. Continue with each bolt until the wing is securely tightened to the fuselage. Be careful not to over-tighten.

► **Note:** Leave the wing on the fuselage for installing the horizontal stabilizer.

# 5

## INSTALLING HORIZONTAL STABILIZER

### ► Parts Needed

Horizontal Stabilizer  
Fuselage  
Assembled wing

### ► Tools & Adhesives Needed

Hobby knife                      Paper towels  
Ruler                                Rubbing alcohol  
Felt tipped pen                Mixing stick  
Pencil                                Epoxy brush  
30-minute epoxy                Masking tape

► **Note:** Before assembling the tail, remove the elevator and the hinges from the horizontal stabilizer. The hinges and elevator will be installed later.

1. Measure and mark the center of the horizontal stabilizer on its leading edge.
2. If you removed it from the previous section of this manual, install the wing onto the fuselage.



- On the bottom of the aft end of the fuselage you will find a notch for the horizontal stabilizer to be placed. Make a center mark on the front of the saddle on the fuselage and place the horizontal stabilizer into the horizontal stabilizer saddle, aligning the two marks you just made. Tape the leading edge of the stabilizer to the fuselage to secure it for now.



- Align the horizontal stabilizer by measuring from a fixed point on the wing to the outside of the trailing edge tip of the horizontal stabilizer. Be sure that the leading edge stays on its center mark. Adjust the stabilizer until you have an equal distance on both the right and left sides of the stabilizer to the wing.



- When you are satisfied with the alignment of the tail to the wing, carefully mark the position with a pencil at the junction where the horizontal stabilizer meets the fuselage. The pencil should leave a slight indentation in the covering.



- Remove the horizontal stabilizer from the fuselage. Using your hobby knife and a straight edge, carefully cut the covering approximately 1/16" inside the lines you drew. **It is very important that you do not press hard enough to cut into the wood as doing so could weaken the horizontal stabilizer.**

- Mix approximately 1/4 ounce of 30-minute epoxy to install the horizontal stabilizer. Using an epoxy brush or mixing stick, spread the epoxy onto the top of the horizontal stabilizer where it comes into contact with the fuselage.



- Lay the stabilizer onto a flat work surface and position the fuselage onto it, making sure it is centered and aligned as per Step 3 and 4.

➤ **Hint:** Reference the bare wood that you just exposed to re-align the stabilizer. Place a heavy object (that won't damage the fuselage structure) on top of the fuselage to press the stabilizer and fuselage together.

➤ **Note:** Be sure that the horizontal stabilizer and fuselage are assembled on a good, flat surface and that they are level with each other.



- Wipe off any excess epoxy using a paper towel and rubbing alcohol. Allow the epoxy to cure fully before proceeding to the next step.

## 6

## INSTALLING VERTICAL FIN

► **Parts Needed**

Vertical tail  
Fuselage

► **Tools & Adhesives Needed**

30-minute epoxy	Paper towels
Hobby knife	90 degree triangle
Pencil	Epoxy brush
Masking tape	Mixing stick
Rubbing alcohol	

1. On the rear of the fuselage, a slot is pre-cut in the wood structure for the vertical fin. Using a sharp hobby knife, cut away the covering on the top rear of the fuselage where the vertical fin inserts into the fuselage.



2. Remove the rudder and hinges from the vertical fin if you have not already done so. These will be assembled later.
  3. Insert the vertical fin into the slot in the top of the fuselage and check to make sure it is fully seated down against the horizontal stabilizer. Make sure the rear of the vertical fin (where the hinge slots are located) is aligned with the rear of the fuselage.
- **Note:** The elevator should **not** be hinged to the horizontal stabilizer at this time. It will also be assembled later. Carefully mark with a pencil the position of the vertical fin on both sides where it exits the fuselage.



4. Remove the vertical fin and carefully cut away the covering with a sharp hobby knife inside the lines you marked in Step 3. **Do not cut into the wood of the fin when cutting the covering.**

5. Mix up approximately 1/4 ounce of 30-minute epoxy and apply it the vertical fin where it comes in contact with the fuselage. Also apply epoxy to the base of the fin where it comes in contact with the horizontal stabilizer.



6. Insert the fin into the fuselage and wipe away any excess epoxy.
7. Using a 90 degree triangle, make sure the fin is perpendicular to the horizontal stabilizer. Use masking tape to hold the vertical fin in place until it's completely dry.





- **Important! Please Read:** Before proceeding any further in the assembly of your Super Stick, you will need to decide whether you want it to be equipped with a tail dragger or tricycle landing gear system.

Experienced pilots prefer the tail dragger configuration as its reduced weight and cleaner aerodynamics give slightly better performance. The position of the main gear is quite a bit ahead of the center of gravity so nose overs are minimized.

If this is your first sport airplane, you'll want to consider the tricycle set-up. It provides even more stable ground handling at only a slight weight and drag penalty.



#### WHY A TAIL DRAGGER?

- **Pros:**
- Lighter weight — eliminates nose gear, nose wheel and steering linkage
  - Easier to install — no nose gear linkage
  - Less aerodynamic drag — no nose gear to cut through the air
  - Cleaner looks
- **Cons:**
- Can nose over in tall grass
  - Ground handling is slightly less stable, requiring some right rudder input on takeoffs
  - More likely to break the prop on rough landings

#### WHY A TRICYCLE?

- **Pros:**
- Super stable ground handling
  - Superior for rough grass fields
  - Improved prop protection
- **Cons:**
- Heavier — additional nose gear assembly
  - More work to install — installation of linkage to nose gear for steering control

## 8

## INSTALLING THE TAIL WHEEL ASSEMBLY

► **Parts Needed**

Tail wheel assembly	Elevator
Tail wheel	Hinges
2.6mm wood screws	Tail wheel collar
Fuselage	Locking screw
Rudder	

► **Tools & Adhesives Needed**

Phillips screwdriver  
Drill  
Drill bits: 3/32", 1/16"  
Hobby knife  
Pencil

1. Insert three hinges into the pre-cut slots of the rudder (**do not glue at this time**) and install the rudder to the vertical fin.
2. Take the tail wheel assembly and place it in the location to be installed on the bottom side of horizontal stabilizer as shown.
3. The tail wheel's guide wire will be installed into the rudder. Mark the position where the hole is to be drilled into the leading edge of the rudder for the steering rod.



4. Remove the rudder. Using a 3/32" drill bit, drill into the exact center of the leading edge of the rudder to accept the tail wheel guide wire as shown.



5. Re-install the rudder with the tail wheel assembly and mark the screw location for the tail wheel mounting plate.
- **Note:** Using your hobby knife, make a small notch in the horizontal stabilizer to allow the tail wheel bracket to lay completely flat on the stabilizer.



6. Remove the rudder from the vertical fin and drill a 1/16" hole in the two screw locations. Install the tail wheel assembly to the fuselage using the two 2.6mm wood screws.



7. Temporarily install the rudder onto the vertical fin, making sure the tail wheel guide wire is inserted into the hole you previously drilled. **Do not glue the hinges at this time.**
8. Take the elevator and insert the four hinges into the hinge slots (**do not glue the hinges at this time**). Temporarily install it onto the horizontal stabilizer.
9. Mark with your pencil the leading edge of the elevator at the point where it contacts the tail wheel wire.



10. Remove the elevator. Using your hobby knife, carefully cut a notch, at the mark on the elevator, the same size as the tail wheel wire. Make the notch as small as possible. Trial fit the elevator back onto the horizontal stabilizer until you are satisfied with the fit. Remove the elevator when done.

► **Note:** All gaps in the hinge lines of the control surfaces should be as minimal as possible. No gap is best.



11. Install the tail wheel onto the tail wheel assembly and secure it with the supplied tail wheel collar and screw.



## 9

## HINGING THE RUDDER AND ELEVATOR

► **Parts Needed**

Fuselage  
Rudder  
Elevator  
Hinges

► **Tools & Adhesives Needed**

30-minute epoxy  
Mixing stick  
Paper towels  
Rubbing alcohol

1. Take the 3 hinges for the rudder and flex them accordingly so they move freely.
  2. Mix a small amount of 30-minute epoxy. Using either a mixing stick or a piece of scrap wood, apply the epoxy sparingly inside each hinge slot on the rudder. Additionally, apply a small amount of epoxy to the top and bottom half of each hinge. Insert the hinges into the rudder until the hinge line is even with the leading edge of the rudder.
  3. Apply epoxy to the remaining half of each hinge and into the hinge slots in the vertical fin as well. Replace the rudder onto the vertical fin.
- **Note:** Be sure to insert the tail wheel wire guide into the rudder.
4. Carefully wipe away any excess epoxy using a paper towel and rubbing alcohol.
  5. Repeat this procedure to install the elevator to the horizontal stabilizer.



## 10

## INSTALLING THE CONTROL HORNS

► **Parts Needed**

Control horns  
Control horn backplates  
Control horn screws  
Fuselage  
Wing

► **Tools & Adhesives Needed**

Drill  
Drill bit: 1/16"  
Felt tipped pen or pencil  
Phillips screwdriver  
Ruler

- **Important:** When installing the control horns, it is important that the holes in the control horns where the pushrod attaches are directly in-line with the control surface hinge line.
1. To locate the elevator control horns, measure over 1/2" to the right from the center of the tail section on the fuselage. Mark the elevator as shown with a felt tipped pen or a pencil. This mark will be the center of the elevator control horn.



2. Place the center of the control horn on the elevator at the mark made in the previous step. Mark the hole positions of the control horn.



3. Remove the control horn and drill two 1/16" holes through the elevator as marked.



4. Attach the elevator control horn using the hardware provided (two screws and backplate) and fasten in place using a Phillips screwdriver.



5. Measure up 1/2" from the fuselage on the left side of the rudder. Mark this location using a felt tipped pen or a pencil. This mark will serve as the center for the rudder control horn.



6. Center the control horn over the mark you have just made and using a felt tipped pen or a pencil, mark the mounting hole locations through both holes onto the rudder.



7. Drill these holes with a 1/16" drill bit and install the rudder control horn using the two screws and backplate provided.



## 10

INSTALLING THE CONTROL HORNS *continued*

8. Turn the wing upside down. From the aileron servo control horn that is attached to your servo (which was installed earlier in this manual), mark the location of the control horn directly in-line with the control arm as shown. Remember to locate the control horn holes so they are directly above the hinge line.
9. Repeat this procedure for the other aileron linkage.



## 11

## INSTALLING THE MAIN LANDING GEAR BLOCK — TAIL DRAGGER

➤ **Parts Needed**

Landing gear block  
Fuselage

➤ **Tools & Adhesives Needed**

6-minute or 30-minute epoxy  
Mixing stick or epoxy brush  
Pencil  
Medium sandpaper

- **Note:** If you are building your Super Stick with a Tricycle gear system, skip this section.
1. Trial fit the landing gear block in the front of the second former (F-2) of the fuselage. Take note of which side of the block is down as this is the side to which you will apply epoxy. (The firewall is what the engine mount is installed onto and is the first former, F-1.)
- **Note:** The landing gear block will have a tight fit against the fuselage sides. That way it will work with either of the two landing gear setups. Sand the block to fit.
2. After you have trial fit the landing gear block, mix up approximately 1/4 ounce of 6-minute (or 30-minute) epoxy.
  3. Spread a generous amount of epoxy onto the bottom of the landing gear block. Place the landing gear block in the location for your main landing gear. Press firmly into place and allow to dry.



# 12

## INSTALLING THE MAIN LANDING GEAR BLOCK — TRICYCLE GEAR

### ► Parts Needed

Landing gear block  
Fuselage

### ► Tools & Adhesives Needed

6-minute or 30-minute epoxy  
Mixing stick or epoxy brush  
Pencil

1. Take the landing gear block and trial fit it in front of the servo tray former of the fuselage. The servo tray former is the third former back from the firewall of the fuselage. Take note of which side of the block is down as this is the side to which you will apply epoxy. (The firewall is what the engine mount is installed onto and is the first former, F-1.)

- **Note:** The landing gear block will not have a tight fit against the fuselage sides. That way it will work with either of the two landing gear setups. Sand the block to fit.

2. After you have trial fit the landing gear block, mix up approximately 1/4 ounce of 6-minute (or 30-minute) epoxy.
3. Spread a generous amount of epoxy onto the bottom of the landing gear block. Place the landing gear block in the location for your main landing gear. Press firmly into place and allow to dry.



# 13

## INSTALLING THE MAIN LANDING GEAR

### ► Parts Needed

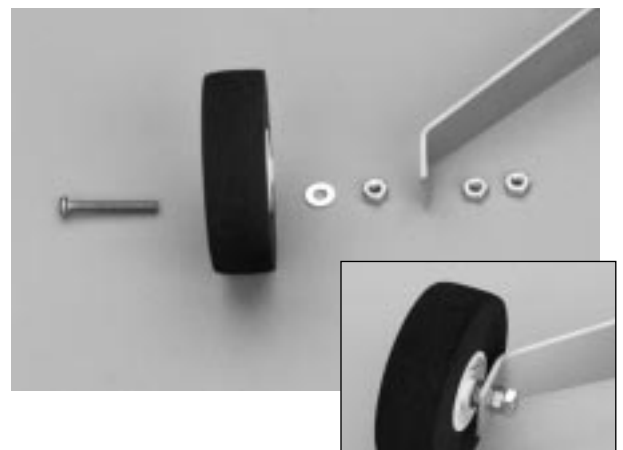
Main landing gear  
Fuselage  
4 x 20mm bolts  
6 nuts  
Small wood screw  
(not supplied — tail dragger only)

### ► Tools & Adhesives Needed

Felt tipped pen or pencil  
Hobby knife  
Drill  
Drill bit: 1/16", 5/32"  
Phillips screwdriver

1. Attach the wheels to the aluminum landing gear using the long 4 x 20mm screws. Note that each screw passed through the wheel and then through a 4mm washer, a 4mm nut, the landing gear and finally into a second 4mm nut.

- **Note:** It is a good idea to put a second nut on the end of the bolt. Be sure to use Blue Locktite 242 to keep the nut from loosening.



2. Locate the three hole indentations in the bottom of the fuselage that are directly underneath where you installed the landing gear block inside the fuselage.

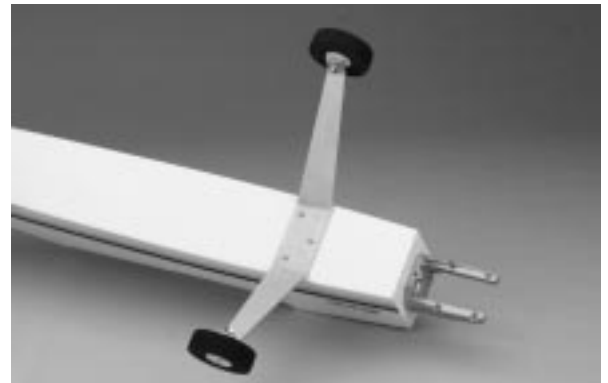


- **Note:** If you are building your Super Stick as a tail dragger, use a small wood screw (like a servo mounting screw) for the middle hole of the landing gear.
- **Hint:** Do not use the supplied bolt in this middle location as it will interfere with the fuel tank. Instead, use a small wood screw (not supplied).

3. From the bottom of the fuselage, drill out the two outside holes with a 5/32" drill bit through the landing gear block. Drill the middle hole using an 1/16" drill bit.



4. Bolt the landing gear onto the fuselage with the included hardware. Take the bolt and insert through the landing gear and secure it with another washer and a nut on the inside of the fuselage.





➤ **Parts Needed**

Nose gear  
Nose gear control horn with 3mm screw  
5/32" wheel collar with 3mm screw (3)  
Nose wheel  
Nose gear mount

➤ **Tools & Adhesives Needed**

Phillips screwdriver  
Blue Locktite 242  
Drill  
Drill bit: 1/16"  
Moto-tool

- **Note:** If you are building your Super Stick as a tail dragger, skip to the next section.
1. Locate the nose gear, nose gear control horn, nose gear mount, one 5/32" wheel collar, and two 2.6mm screws.



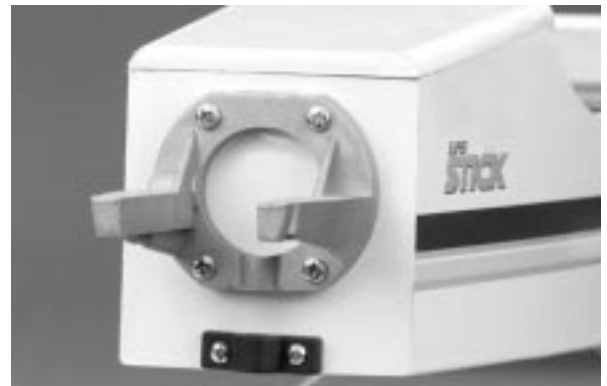
2. With the screw hole facing forward, slide the nose gear control horn onto the straight end of the nose gear so the control horn is situated in the flat spot on the gear next to the coil.

- **Note:** If you do not have a flat spot on your landing gear, you can easily make a flat spot using a Moto-tool.



3. Install the nose gear mount flush with the bottom of firewall. Drill 1/16" holes and install wood screws.

- **Important:** Make sure the guide hole in the mounting bracket is directly in line with the gear hole in the engine mount.



4. Place a 5/32" wheel collar between the nose gear mount and the motor mount. Insert the nose gear assembly up through the nose gear mount until the coil is just below the bottom of the fuselage.



5. Adjust the nose gear control horn until the arm is parallel with the firewall. Apply Blue Locktite 242 to a 3mm screw and secure the steering arm in place.

6. Secure the remaining wheel collar using Blue Locktite 242 and a 3mm screw.

7. Install the front nose wheel using the supplied collar and screw.

- **Important:** Be sure the nose wheel is aligned perpendicular to the nose gear control horn as shown.

► **Parts Needed**

Fuel tank	Aluminum tube, long (vent)
Fuel tubing (no supplied)	Silicone tubing
Fuel klunk	Rubber stopper
Aluminum tube, short (pickup)	Long self tapping screw
	Fuselage

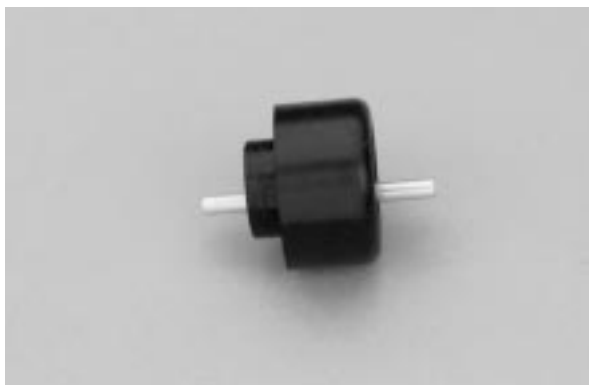
► **Tools & Adhesives Needed**

Hobby knife  
Phillips screwdriver

1. Locate the fuel tank and the fuel tank accessories.



2. Insert the short aluminum tube into one of the open holes in the black rubber stopper so that an equal amount of the tube extends from either side. This tube will be used as the fuel tank pickup tube.



3. Locate the longer aluminum tube and bend it carefully using your fingers as shown. This tube will be the fuel tank vent tube.



4. Slide this tube into the remaining hole in the black rubber stopper. It is easier if the tube is inserted through the rear of the stopper, with the straight portion first.



5. Slide the two plastic caps over the tubes as shown. Note the orientation of the caps. The small inside cap and the raised center face the black rubber stopper. The large outside cap with the raised center face away from the black rubber stopper. Insert the self tapping screw into the end of cap and tighten slightly.



6. Locate the silicone fuel tubing and the metal fuel klunk. Insert the fuel klunk into one end of the fuel tubing. This assembly will be used for the fuel pickup inside the fuel tank.



7. Install the open end of the fuel tubing on the shorter aluminum tubing.



8. Carefully insert the assembly into the fuel tank and press the fuel tank cap on firmly. Note the position of the vent tube. To function properly the vent tube must be positioned at the top of the tank.

- **Note:** It is important to ensure that the fuel tank klunk does not touch the rear of the fuel tank. If it does, simply cut a small portion off of the silicone fuel tubing until the klunk no longer reaches the rear of the tank.

9. It is important to note that the stopper is mounted closer to one edge of the fuel tank than the other. This "closer edge" is the top of the fuel tank.

- **Important:** Remember which tube is the fuel tank pickup and which is the vent so you will properly connect fuel lines to the engine.

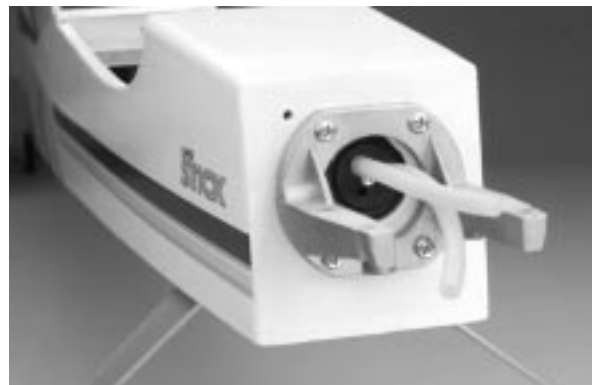


10. Cut away the covering in the center of the firewall in the middle of the engine mount.

11. Place the foam fuel tank collar around the neck of the fuel tank and press the fuel tank into the fuselage firmly against the firewall.



12. Place the tank into the fuselage and press it into position until the stopper on the tank inserts into the hole in the firewall. Connect 5" pieces of fuel line to the installed tank.



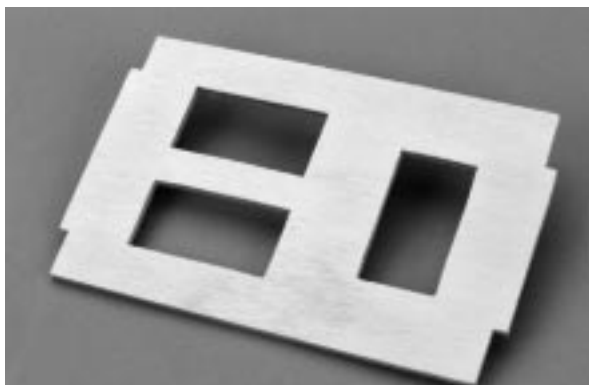
► **Parts Needed**

Fuselage  
Plywood servo tray  
3 servos

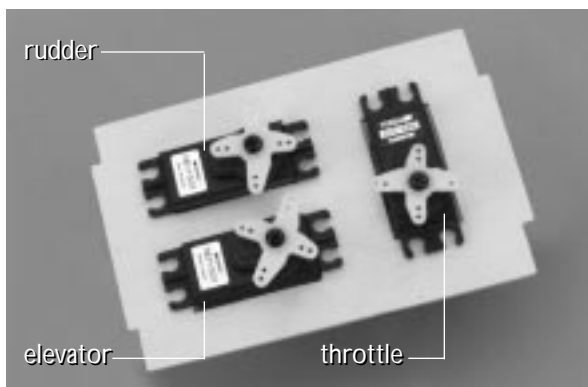
► **Tools & Adhesives Needed**

Hobby knife or round file  
6-minute epoxy  
Epoxy brush

1. Remove the plywood servo tray from the die-cut plywood sheet.

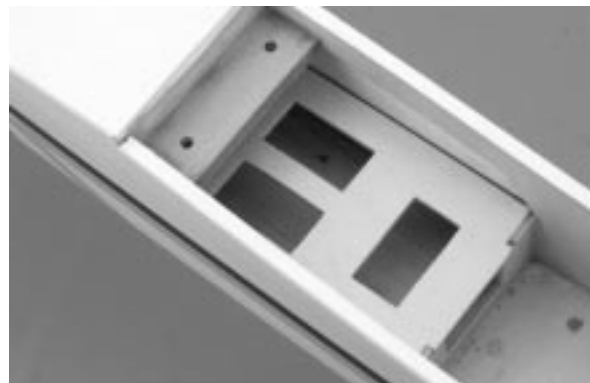


2. Trial fit the throttle, elevator and rudder servos in the servo tray. Depending upon the servos utilized, it may be necessary to enlarge the openings in the tray slightly. To do so, use a file or sharp hobby knife accordingly.



3. After the proper servo fit has been achieved, remove the three servos from the servo tray. Trial fit the servo tray into the fuselage, noting the correct orientation. The single servo cut-out should be closest to the front of the fuselage.

- **Note:** The tray should seat snugly into the notches in the servo tray support and fuselage former. If it doesn't, remove a small portion of the tab from the servo tray using a file or sharp hobby knife.



4. Mix a small amount, approximately 1/8 ounce, of 6-minute epoxy. Using an epoxy brush, apply epoxy to the servo tray in the areas that will come in contact with the servo tray support and the fuselage sides. Install the servo tray into the fuselage, noting the correct orientation as described in Step 3 of this section.



➤ **Parts Needed**

Engine  
 Engine mounting bracket (2)  
 Engine mounting screws and nuts (4 each)  
 Fuselage

➤ **Tools & Adhesives Needed**

Phillips screwdriver  
 Blue Locktite 242

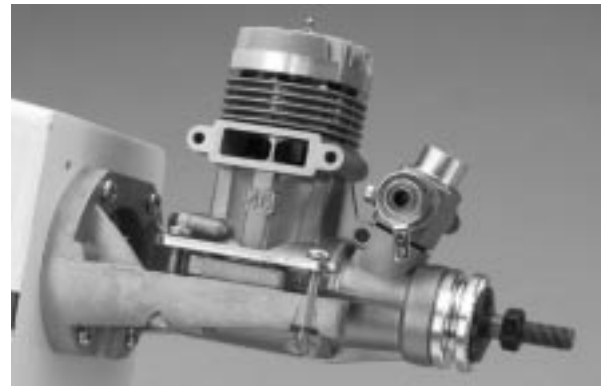
1. Remove the two engine mounting brackets, four 4 x 20mm screws and four 4mm nuts from the hardware bag.
2. Position the engine on the motor mount so the center line of the engine is in line with the center line of the fuselage.



3. Place one engine mounting bracket, across each of the engine mounting lugs as shown.



4. Insert one 4 x 20mm screw into each of the engine mounting bracket holes. Press one of the 4mm nuts into the corresponding receptacle on the bottom of the motor mount. Apply Blue Locktite 242 to secure the nut in place and firmly tighten the screw.



5. Install the fuel tube from the fuel tank pickup line to the carburetor fuel nipple. The vent line will be installed onto the pressure nipple after the muffler is installed.

- **Hint:** Do not install the muffler to the engine until after the throttle linkage is installed.

# 18

## INSTALLING THE SPINNER

### ► Parts Needed

Spinner  
Spinner backplate  
Spinner screws (2)  
Fuselage

### ► Tools & Adhesives Needed

Phillips screwdriver

1. Remove the propeller nut and prop washer from the engine. Install the spinner backplate on the crankshaft, as shown.



2. Place the propeller onto the crankshaft so it seats correctly against the spinner backplate. Next, install the washer and the prop nut onto the crankshaft and tighten securely.



3. Attach the spinner to the spinner backplate using the two screws provided in the hardware bag.
- **Note:** Be sure not to over-tighten the spinner screws as doing so would damage the spinner screws.

# 19

## INSTALLING THE RADIO SYSTEM

### ► Parts Needed

4-channel radio system with 3 servos and hardware (not included)  
Fuselage  
Radio packing foam (not included)  
Antenna tube (optional, not included)  
Y-harness (optional, must have if using a 4-channel radio)

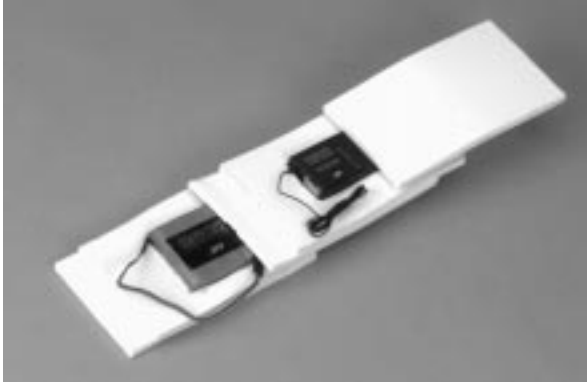
### ► Tools & Adhesives Needed

Phillips screwdriver  
Hobby knife  
Drill  
Drill bit: 1/16"

1. Install the rubber grommets and eyelets in the three remaining servos. Position the servos in the fuselage servo tray as shown, noting the location of the output horns. Screw the servos in place using 12 servo screws, which are included with the servos.



- Use radio packing foam (available at your local hobby dealer) when you install the receiver and battery. With a sharp hobby knife, cut a solid layer of foam the size of the compartment that is in front of the servo tray. Cut out another layer of foam that is identical in size, however, cut an opening in the center of this foam so it will accept the receiver battery pack. Place another solid layer of foam on top of this layer. Cut another layer of foam to accept the receiver. The final layer of foam should be solid.



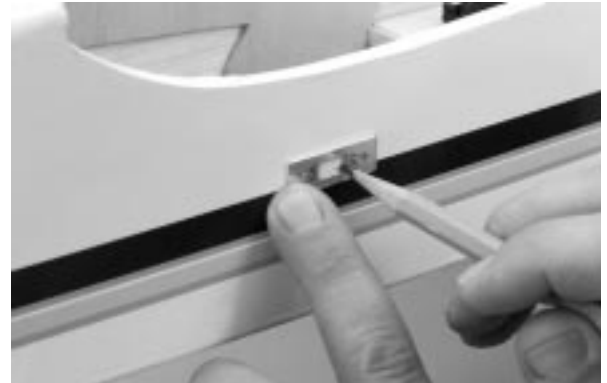
- Place the layers of foam with the battery and receiver in their respective locations in the front compartment of the fuselage as shown. Route the antenna back through the fuselage using an antenna tube (not included) or route it outside the fuselage back to the vertical stabilizer.



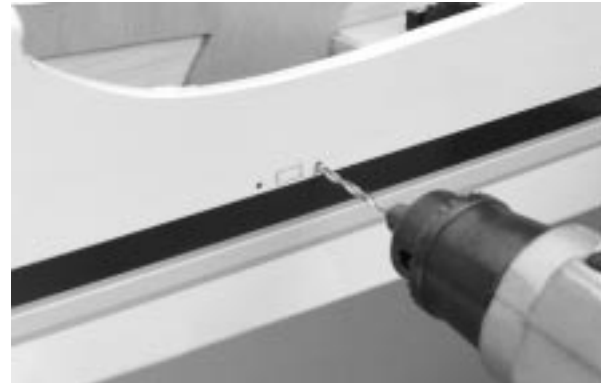
- The switch should be mounted on the left side of the fuselage, away from the exhaust.



- **Hint:** Remove the switch plate to use as a template.



- Drill the two mounting holes as marked using a 1/16" drill bit. Using your hobby knife, carefully cut out for the receiver switch between the screw holes.



- Reposition the switch plate as shown and place the switch on the inside of the fuselage. Using the two screws supplied with the switch, attach the switch to the fuselage.



► **Parts Needed**

Wing  
Heat shrink tubing  
Clevises  
Threaded rods

► **Tools & Adhesives Needed**

Z-bend pliers  
Felt tipped pen  
Thick CA glue  
Hobby knife  
Heat gun  
Wire cutters

1. Locate two of the threaded rods. Thread a clevis at least 20 turns, onto each rod. Be sure they are **not** the longer rods.



2. Install the clevis with the attached linkage to the aileron control horn. Center the servo horn as shown and, using a felt tipped pen, make a mark on the linkage where the Z-bend will be inserted into the horn.



3. Make a Z-bend in the linkage and cut off the excess linkage.

- **Important:** Do not discard the piece of linkage you just cut off; this will be used to make the rudder and elevator pushrods.



4. Center the servo horn and install the Z-bend into the outer-most hole of a standard size.

5. Attach the linkages onto their respective aileron horns.

- **Note:** It is a good idea to place a piece of fuel tubing over the clevises as shown. This will provide extra insurance against the clevises accidentally coming open.

6. With the servo arm centered as shown, adjust the aileron linkage until the aileron is exactly in the neutral position. Follow this procedure for both aileron linkages.



**TOTAL PUSHROD & ACCESSORIES  
LIST FOR SUPER STICK**

- 2 Long threaded rods (throttle, nose gear)  
5 Threaded rods (ailerons, rudder, elevator)  
2 Wooden dowels (pushrods)  
2 Heat shrink tubing  
1 Control horn/clevis parts tree



► **Parts Needed**

Fuselage  
2 threaded rods  
2 rods cut off from aileron linkage (Section 20)  
Heat shrink tubing  
Clevis

► **Tools & Adhesives Needed**

Z-bend pliers  
Felt tipped pen  
Thick CA glue  
Hobby knife  
Heat gun  
Wire cutters  
Ruler  
Masking tape

1. Locate one of the threaded rods, one piece of the extra rod from Section 20, one piece of the yellow heat shrink tubing, one clevis and one of the balsa pushrod dowels.



2. Cut the heat shrink into two equal pieces with a sharp hobby knife or a pair of scissors.
3. Carefully cut away the covering on the top left side of the fuselage next to the vertical fin for the rudder and the right side for the elevator — this is where the pushrods will exit.

- **Note:** If the fuselage does not have a pre-cut slots under the covering for the pushrods to exit from, carefully cut a notch in the fuselage as shown.

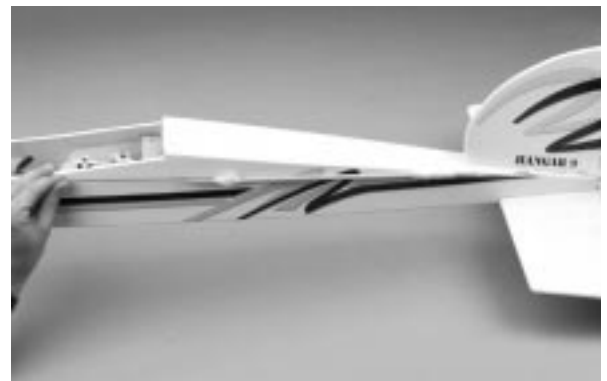


4. To determine the approximate length of the pushrods, temporarily tape a rod (using masking tape) with the threaded end, half the distance of the rod, onto the wooden dowel. Then take the piece of rod you cut off the aileron linkage and tape it onto the other end of the wooden dowel. Make sure you position the rod past the pre-drilled hole in the wooden dowel.

- **Hint:** Do not put any tape around the rod and dowel where the pre-drilled hole is located in the wooden dowel as you are going to need to make a mark on the rod.



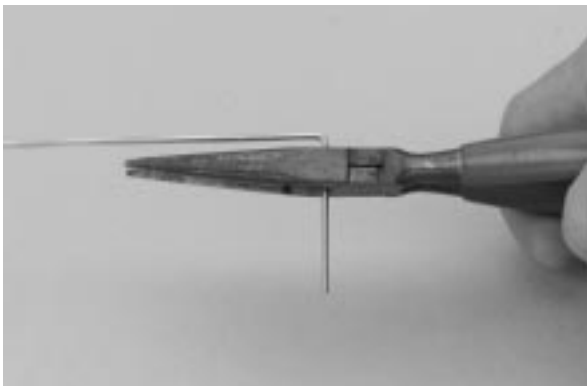
5. Thread a clevis at least 12 turns onto the threaded rod. Position the temporarily assembled pushrod along the outside of the fuselage, lining it up with the control horn and extending it over the servos.



6. Adjust the rods on the wooden dowel if necessary to allow for a Z-bend to be made in the non-threaded rod that will be attached to the servo.
7. Mark the non-threaded rod where the Z-bend will be located. Also mark the rods where the pre-drilled holes are located in the dowel.



8. Disassemble the pushrod and remove the clevis. Make a 90 degree bend on the non-threaded rod at the mark where the pre-drilled hole is located on the wooden dowel. Leave a 1/4" of rod after the 90 degree bend and cut off any excess. Make a 90 degree bend in the threaded rod at the mark of the pre-drilled hole of the wooden dowel and leave a 1/4" of rod after the bend.



9. Insert the 90 degree bend into the hole of the balsa dowel and saturate the balsa with thick CA glue where the rod contacts the balsa.
10. Slide a piece of heat shrink tubing over each end of the balsa dowel and shrink it in place using a heat gun.

11. Insert the pushrod assembly, threaded rod first, into the fuselage so the threaded rod exits the rudder pushrod hole. Screw on a clevis 20 complete turns. Fasten the clevis to the rudder control horn.

► **Note:** It is a good idea to place a piece of fuel tubing over the clevis (as shown) as extra insurance to prevent the clevis from accidentally coming open.



12. Center the rudder and elevator servo, and using a felt tipped pen, place a mark on the end of the pushrod where it passes the connection hole of servo horn.



13. Using Z-bend pliers, make a Z-bend at the marked location on the rod. Cut off the excess rod past the Z-bend.

14. Insert the Z-bend into the servo arm.

► **Hint:** It may be necessary to remove the servo arm to insert the Z-bend.



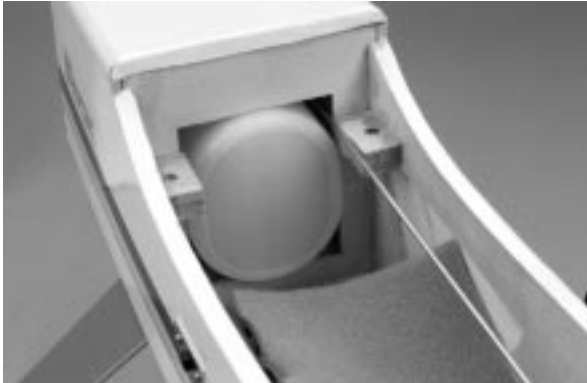
► **Parts Needed**

- 1 Long threaded rod
- 1 Clevis
- Fuselage

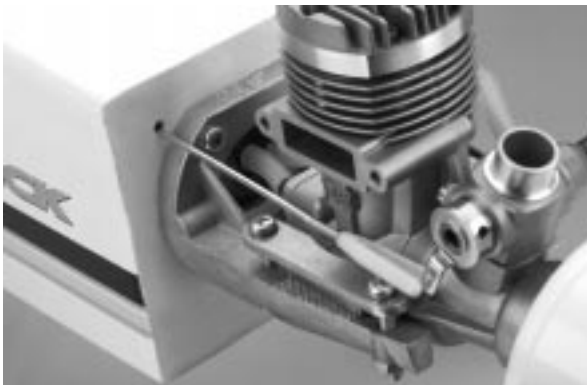
► **Tools & Adhesives Needed**

- Z-bend pliers
- Wire cutters
- Felt tipped pen

1. Locate one of the longer threaded rods and one clevis.
2. Screw the clevis onto the threaded end of the rod approximately 20 turns.
3. Insert the threaded rod, unthreaded end first, through the 1/16" throttle linkage hole in the firewall. The rod should exit through the radio tray compartment.



4. Attach the clevis to the throttle lever of the carburetor, opening the carburetor half way.



5. Center the throttle servo. Using a felt tipped pen, mark the rod where it passes the respective servo arm.

- **Note:** It is important to be sure that the carburetor remains half open when the throttle servo is centered.



6. Using Z-bend pliers, make a Z-bend at the marked spot on the rod. Cut-off the excess rod. Remove throttle servo arm and insert Z-bend into servo arm.

► **Parts Needed**

Fuselage  
Long threaded rod  
Clevis

► **Tools & Adhesives Needed**

Z-bend pliers  
Wire cutters  
Felt tipped pen

1. Locate the remaining long threaded rod and clevis.



2. Carefully cut away the covering on the bottom of the fuselage where the pushrod will exit, if not already done.
3. Insert the threaded rod, threaded end first, through the nose wheel linkage slot and into its respective 1/16" guidance holes in the fuselage.

4. Screw on a clevis 20 full turns. Fasten the clevis in the outermost servo arm hole opposite of the rudder servo Z-bend.



5. Be sure that the rudder servo is centered. Using a felt tipped pen, place a mark on the unthreaded end of the pushrod where it passes the respective servo arm.
6. Using Z-bend pliers, make a Z-bend at the marked location on the rod. Cut off the excess rod.
7. Insert the Z-bend into the hole on the servo control arm. It may be necessary to remove the control arm during installation of the Z-bend.

## 24

## CONTROL THROW RECOMMENDATION

The following control throws offer the most positive response and are a good place to begin. After you've become more familiar with the flight characteristics, adjust the control throws to meet your style of flying.

## SUPER STICK 40

## ➤ Normal Rate

Aileron: 5/16" up, 5/16" down  
 Elevator: 3/8" up, 3/8" down  
 Rudder: 7/8" right, 7/8" left

## ➤ High Rate

Aileron: 1/2" up, 1/2" down  
 Elevator: 1/2" up, 1/2" down  
 Rudder: 1-3/8" right, 1-3/8" left

## SUPER STICK 60

## ➤ Normal Rate

Aileron: 3/8" up, 3/8" down  
 Elevator: 3/8" up, 3/8" down  
 Rudder: 1" right, 1" left

## ➤ High Rate

Aileron: 5/8" up, 5/8" down  
 Elevator: 5/8" up, 5/8" down  
 Rudder: 1-5/8" right, 1-5/8" left

## 25

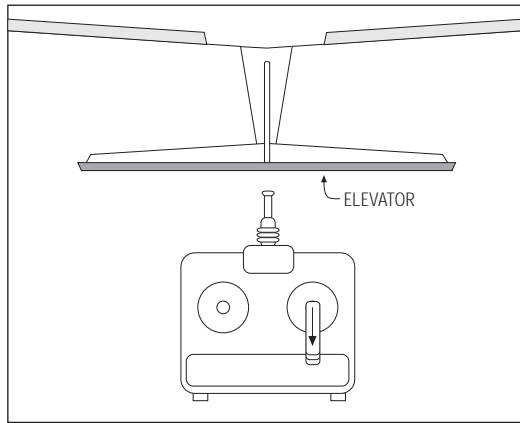
## BALANCING THE SUPER STICK

An important part of preparing the aircraft for flight is properly balancing the model. Don't inadvertently neglect this step. The recommended C.G. (Center of Gravity) location for the first flights with the Super Stick is 1/8" behind the main spar of the wing (the main spar spans the length of the wing underneath the back edge of the wing sheathing).

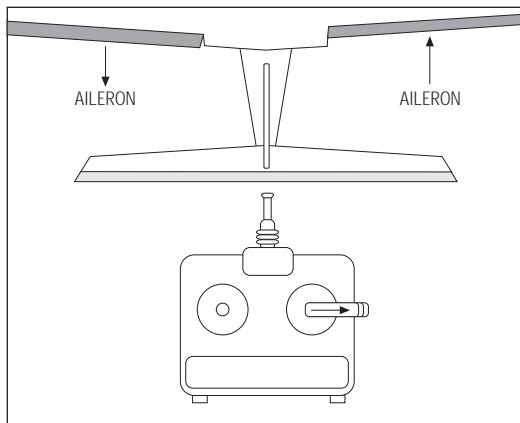
If necessary, add weight to either the tail or nose until the correct balance is achieved. Stick-on weights are available at your local hobby shop and work well for this purpose.

# PRE-FLIGHT CHECK

1. Check that all control functions move in the correct direction. If not, use the respective reversing switch to correct the direction.

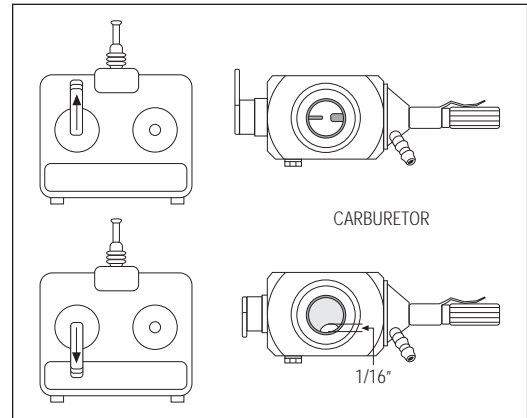


ELEVATOR

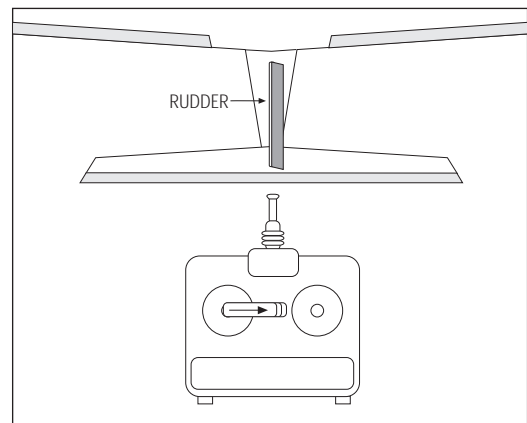


AILERON

➤ **Note:** Mode II transmitter shown in diagrams.



THROTTLE



RUDDER

2. Check that each clevis is securely snapped into position.
3. Check that all servo horn screws are tight.
4. Charge the transmitter and receiver battery per the instructions included with the radio system.
5. Read and follow all the instructions included with the engine and follow the recommended break-in procedure.

# PRE-FLIGHT AT THE FLYING FIELD

## **Range Test Your Radio**

1. Before each flying session be sure to range check your radio. This is accomplished by turning on your transmitter with the antenna collapsed. Turn on the radio in your airplane. With your airplane on the ground, you should be able to walk 30 paces away from your airplane and still have complete control of all functions. If not, don't attempt to fly! Have your radio equipment checked out by the manufacturer.
2. Double check that all controls (aileron, elevator, throttle, rudder) move in the correct direction.
3. Be sure that your batteries are fully charged per the instructions included with your radio.

## **Adjusting the Engine**

1. Completely read the instructions included with your engine and follow the recommended break-in procedure. At the field adjust the engine to a slightly rich setting at full throttle and adjust the idle and low speed needle so that a consistent idle is achieved. Before you fly be sure that your engine reliably idles, transitions and runs at all throttle settings . Only when this is achieved should any plane be considered ready for flight.

# AMA SAFETY CODE

## 1994 Official AMA National Model Aircraft Safety Code

Effective January 1, 1994

**Model flying must be in accordance with this Code  
in order for AMA liability protection to apply**

### 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 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.
4. 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 those persons essential to the flight operations are to be permitted on the flying side of the line; all others must be on the spectator side. Flying over the spectator side of the line is prohibited, unless beyond the control of the pilot(s). In any case, the maximum permissible takeoff weight of the model is 55 pounds unless as stated in their official rules.
5. At air shows or model flying demonstrations a single straight line must be established, one side of which is for flying, with the other side for spectators. Only those persons accredited by the contest director or other appropriate official as necessary for flight operations or as having duties or functions relating to the conduct of the show or demonstration are to be permitted on the flying side of the line. The only exceptions which may be permitted to the single straight line requirements, under special circumstances involving consideration of site conditions and model size, weight, speed, and power, must be jointly approved by the AMA President and the Executive Director.
6. Under all circumstances, if my model weighs over 20 pounds, I will fly it in accordance with paragraph 5 of this section of the AMA Safety Code.
7. 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 flown indoors.
8. I will not operate models with metal-bladed propellers or with gaseous boosts, in which gases other than air enter their internal combustion engine(s); nor will I operate models with extremely hazardous fuels such as those containing tetranitromethane or hydrazine.
9. I will not operate models with pyrotechnics (any device that explodes, burns, or propels a projectile of any kind) including, but not limited to, rockets, explosive bombs dropped from models, smoke bombs, all explosive gases (such as hydrogen-filled balloons), ground mounted devices launching a projectile. The only exceptions permitted are rockets flown in accordance with the National Model Rocketry Safety Code or those permanently attached (as per JATO use); also those items authorized for Air Show Team use as defined by AST Advisory Committee (document available from AMA HQ). In any case, models using rocket motors as primary means of propulsion are limited to a maximum weight of 3.3 pounds and a G series motor. Note: A model aircraft is defined as an aircraft with or without engine, not able to carry a human being.
10. I will not operate any turbo jet engine (axial or centrifugal flow) unless I have obtained a special waiver for such specific operations from the AMA President and Executive Director and I will abide by any restriction(s) imposed for such operation by them. (Note: This does not apply to ducted fan models using piston engines or electric motors.)
11. I will not consume alcoholic beverages prior to, nor during, participation in any model operations.

### Radio Control

1. I will have completed a successful radio equipment ground range check before the first flight of a new or repaired model.
2. I will not fly my model aircraft in the presence of spectators until I become a qualified flier, unless assisted by an experienced helper.
3. I will perform my initial turn after takeoff away from the pit or spectator areas, and I will not thereafter fly over pit or spectator areas, unless beyond my control.
4. I will operate my model using only radio control frequencies currently allowed by the Federal Communications Commission. (Only properly licensed Amateurs are authorized to operate equipment on Amateur Band frequencies.) Further, any transmitters that I use at a sanctioned event must have a certified R/CMA-AMA gold sticker affixed indicating that it was manufactured or modified for operation at 20 kHz frequency separation (except 27 MHz and 53 MHz).
5. I will not knowingly operate an R/C system within 3 miles of a pre-existing model club flying site without a frequency sharing agreement with that club.