



PROPELLER (supplied): A SIG 7x5 EP propeller is furnished with this model. This propeller provides excellent flight performance when used with the recommended battery pack.

ESC ELECTRONIC SPEED CONTROL (supplied): A 30amp Electronic Speed Control is furnished. This "plug and play" ESC is completely wired at the factory with the appropriate end plugs.

BATTERY PACK (not supplied): We recommend a 7-cell 1100mah Nimh (nickel metal hydride) battery pack, in "flat" configuration, with a Tamiya plug. Properly charged, this battery pack delivers excellent power and duration for the KADET EP-42.

Note: We do not recommend other types or sizes of battery packs without thorough bench and field testing. Flight performance can suffer greatly with the wrong battery pack. In some cases the airplane won't fly at all with the an improper pack. Use the recommended battery pack to insure good performance.

BATTERY CHARGER (not supplied): For maximum performance from your battery pack, you MUST use a proper battery charger!

1) Make sure your charger is designed for the type of cells that are in your battery pack - i.e. a charger made to charge nicad or nickel metal hydride batteries should NEVER be used to charge lithium batteries, and vice versa. Doing so can be very dangerous!

2) Make sure you use a "peak detection" charger. This is a charger that automatically senses when the battery is completely charged (peaked), and then shuts itself off. A peak detection charger not only prevents overcharging of batteries (which will damage them in time), but it also insures that you are getting the maximum charge into the batteries, so that you will realize maximum power and duration from the motor.

INTRODUCTION

Congratulations on your purchase of the SIG KADET EP-42. The KADET EP-42 is the latest addition to the long line of legendary SIG KADET trainers. Did you know that the first SIG KADET was introduced in 1973! Since that time, thousands upon thousands of student pilots have successfully learned to fly R/C with a SIG KADET. Even expert pilots enjoy flying a SIG KADET now and then for an easy going change of pace. Flying low and slow on a dead calm summer evening provides a satisfaction that can't be matched with other types of models.

The KADET EP-42 represents a major milestone in the history of SIG KADETS. This is the first ever electric powered SIG KADET kit! This blending of the legendary KADET flying characteristics with a state-of-the-art electric power system, has produced a marvelous little R/C ship that is a pure joy to fly. It's small enough to carry around in your vehicle completely assembled and ready to fly almost anywhere, anytime! Unlike most other small electric powered models, the KADET EP-42 has a light wing loading - light enough to make you forget that you are flying an electric airplane. That overweight, heavy, afraid-to-slow-it-down feeling you may have experienced with other electric airplanes is gone!

Assembly of your SIG KADET EP-42 ARF is fast and simple when following the detailed instructions in this manual. A low parts count and professional engineering ensure quick and easy assembly. All parts are CAD-drawn, laser-cut, and jig assembled, which means that everything fits the way it should! We urge you to read this instruction manual completely before starting assembly, to familiarize yourself with the parts and the assembly sequence.

AN IMPORTANT NOTE ABOUT LEARNING TO FLY R/C

The KADET EP-42 ARF is certainly a suitable model for learning to fly R/C. However, it is important to understand that if you have never flown an R/C airplane before, you will need to find and use a qualified R/C flight instructor. The instructor should make the first test flight of the new airplane, to make sure it "trims out" to fly properly. After that, he can teach you how to fly the airplane. Without an instructor, your chance of a successful first R/C flight is less than 1 in 1000. You will most likely crash and destroy your new airplane! With a qualified instructor, your chance of learning to fly R/C is nearly 100%. So, if this is your first radio control model airplane, DO NOT attempt to fly it without a qualified instructor. It's the fastest, most efficient way to become a good R/C pilot. And you'll make a new R/C flying buddy.

ELECTRIC POWER SYSTEM

MOTOR (supplied): Your KADET EP-42 comes with a 7.2 volt Speed 400 motor already mounted in the nose of the airplane. Please note that this is a more powerful upgrade from a "normal" speed 400 can motor.

RADIO EQUIPMENT

The KADET EP-42 gets its great flight performance from many factors, but two of the most important factors are its light weight and generous wing area. The lighter the final weight is, the better this airplane will fly! Since this model is factory built and covered, you can only realistically control the finished, ready-to-fly weight by choosing the most appropriate radio equipment for a model of this size. In short, the flight performance of your KADET EP-42 will be directly controlled by the weight of the radio equipment you choose to put in it. Maximum performance can only be achieved with light weight components.

RECEIVER: A small or "micro" size receiver should be used in this model due to weight and size constraints. In our flight tests of the KADET EP-42, we have used the following dual conversion receivers:

<u>receiver</u>	<u>weight</u>
FMA M5	11 grams
Hitec Electron 6	19 grams

Note: Single conversion receivers can also be used as long as you are aware of the potential for interference from other transmitters.

SERVOS: Standard servos, the ones that come with most sport radio systems, are too big and too heavy for the KADET EP-42. You will need smaller servos. In our flight tests of the KADET EP-42, we have used the following servos:

<u>servo</u>	<u>weight</u>	<u>torque</u>
Hitec HS-55	7.9 grams	15 in/oz
Airtronics 94091	9.0 grams	18 in/oz

Note: Any other brand of servo that is in the same size and torque range will also work just fine.

SERVO CHORDS: You will need one Y-Harness Chord to connect the two aileron servos together. This allows you to operate both aileron servos off of one receiver lead. Every radio manufacturer has Y-Harness Chords available for their radio systems. Also, depending on exactly how long the wires are on your aileron servos, you will most likely need two 6" Servo Extension Chords to give you enough wire length to run through the wing.

Note: In our prototype installations, we leave the single end of the Y-harness plugged into the receiver permanently, and then unplug the two aileron servo extension chords from the Y-harness when we remove the wing from the airplane.

COVERING MATERIAL

Your KADET EP-42 has been professionally covered with SIG AEROKOTE-LITE™ iron-on plastic covering material. This is a low temperature covering material that is very tough and light weight, weighing only 5.9 grams per sq.ft.

The colors used on this model are AEROKOTE-LITE™ ...
 #SIGSGX100 Brilliant White, and
 #SIGSGX010 Transparent Red or #SIGSGX050 Transparent Blue

Wrinkles! After you remove the covered model parts from their plastic bags, you may notice within the first couple days that some of the covering material may become slack or wrinkled. If that's the case, there is no need to be alarmed. The covering is not defective! Your KADET EP-42 was covered in a part of the world which has consistently high humidity, and some of that moisture is retained in the balsa wood when the parts were put in the bags. When exposed to drier air, the wood loses the excess moisture, dimensionally shrinking slightly in the process. In turn, this shrinkage may cause some slight relaxing of the covering, causing wrinkles to appear.

Any wrinkles that appear in the covering are easy to remove by applying a little heat from a small modeler's heat iron. Because of this model's small size, we do not recommend using a heat gun to tighten up loose covering. A typical hobby type covering iron will work just fine. Even better is a small modeler's "trim seal" iron, which is perfect for controlling the heat applied to a specific area. Using a small trim iron also minimizes the possibility of warping the thin control surface parts.

For reshinking AEROKOTE-LITE™ set your iron temperature to approximately 140°-180° F (60°-82° C).



First, use the hot iron to go over all the seams and color joints in the covering, making sure they are all sealed down and well adhered. Then, hold the hot iron over the wrinkle to lightly shrink the material - do not press on it. Once the covering is tight, lightly iron it back down to the wood. Use caution whenever the hot iron gets close to a seam in the covering. Over-heating a seam can cause the covering to creep, exposing the wood underneath. Also be careful when working around the windshield and side windows - heat will distort this clear plastic material.

REQUIRED TOOLS

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



- A selection of glues - thin, medium, and thick SIG CA, and SIG Epoxy Glue (5-minute and 30-minute)
- Fine point CA applicator tips
- Screwdrivers
- Pliers - Needle Nose and Flat Nose
- Wire Cutters
- Drill with Assorted Drill Bits
- Pin Vise for small diameter drill bits
- Small T-Pins
- Sandpaper
- Hobby Knife with sharp #11 blades
- Scissors
- Covering Iron and Trim Seal Tool
- Paper Towels
- Rubbing Alcohol (for cleaning off excess epoxy glue)

KIT INVENTORY

The following is a complete list of all parts contained in this kit. Before beginning assembly, we suggest that you take the time to inventory the parts in your kit.

- 1 bag (1) Fuselage, with
- (1) Electric Motor installed
- (1) Molded Plastic Cowling installed
- (1) Clear Plastic Windshield installed
- (1) Clear Plastic Side Windows installed
- 1 bag (1) Right Wing Panel
- (1) Right Aileron
- (3) CA Hinges, installed but not glued
- 1 bag (1) Left Wing Panel
- (1) Left Aileron
- (3) CA Hinges, installed but not glued
- 1 bag (1) Fin
- (1) Rudder
- (3) CA Hinges, installed but not glued
- 1 bag (1) Stabilizer
- (1) Elevator
- (4) CA Hinges, installed but not glued
- 1 bag (1) Aluminum Main Landing Gear
- (2) Main Wheels
- (2) M3 x 20mm Axle Bolts
- (2) M3 Hex Nuts
- (2) M3 Lock Nuts
- (2) M2.6 x 10mm Screws
- 1 bag (2) Aileron Pushrod Wires (short)
- (1) Elevator Pushrod Wire (long)
- (1) Rudder Pushrod Wire (long)
- 1 bag (2) 4-40 x 1" Nylon Wing Bolts
- (4) Nylon Control Horns

- (4) Nylon Pushrod Keepers
- (1) Strip of white AEROKOTE-LITE™ covering
- (1) 3/4" x 1-3/4" Velcro® Tape
- 1 bag □ (1) 1-1/2" dia. Spinner Backplate
- (1) Spinner Cone
- (1) Prop Shaft Adapter Rings
- (2) Screws
- 1 bag □ (1) 7x5 EP Propeller
- 1 bag □ (1) ESC Electronic Speed Control

NOTE: In this manual, any references to right or left, refer to your right or left as if you were seated in the cockpit of the airplane.

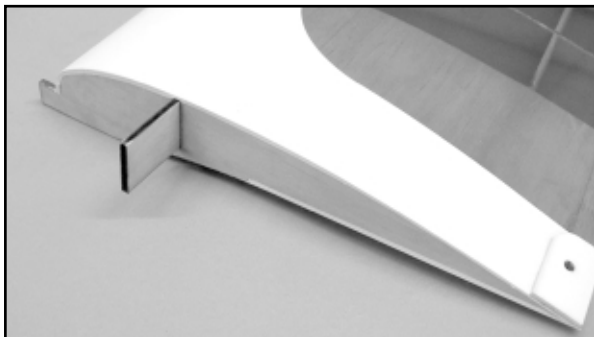
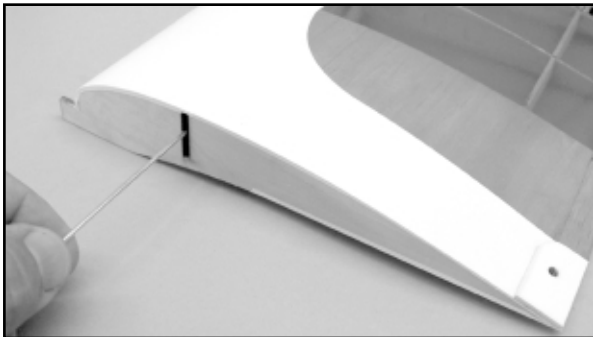
WING ASSEMBLY

From the kit contents locate the right and left wing panels and the plywood wing joiner. You will also need epoxy glue, epoxy mixing supplies, paper towels, and rubbing alcohol.

□ 22) For maximum strength, we recommend using SIG Epoxy Glue for joining the wing panels in this step.

a) Trial fit both wing panels together, without glue, on the plywood wing joiner to familiarize yourself with the assembly. Then take back apart.

b) Mix up a small amount of epoxy glue. Use a wire or stick to quickly coat the inside of the wing joiner slot in the end of the right wing panel. Also coat the right half of the plywood wing joiner with glue. Push the plywood wing joiner all the way into the slot in the right wing panel. Hold the wing joiner in place until the glue dries, wiping off any excess glue that oozes out of the joint.

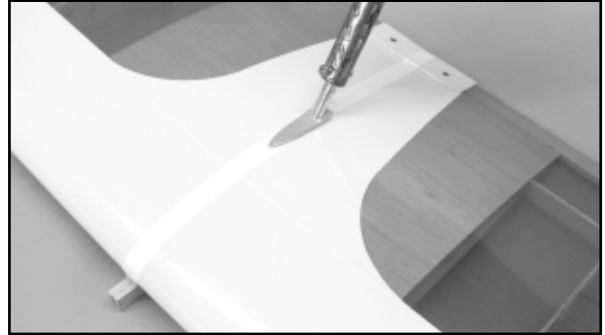


c) Mix up a larger batch of epoxy glue. Use a wire or stick to coat the inside of the slot in the end of the left wing panel with glue. Also coat the stub of the plywood wing joiner that is sticking out of the right wing panel, and the bare wood end ribs of both wing panels. Then put the wing panels together. Squeeze the panels tightly together, aligning the leading and trailing edges of the wing panels with each other. Wipe off any excess glue that oozes out of the joint with a paper towel soaked in rubbing alcohol. Hold or tape the wing panels in proper position until dry.

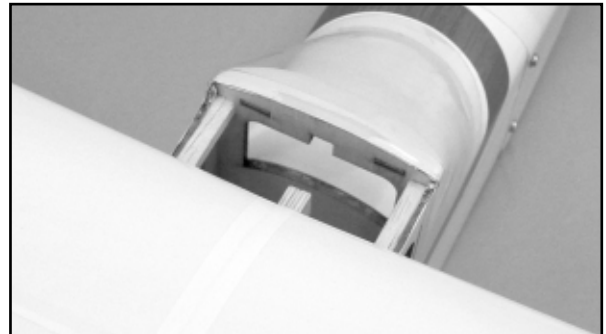
Note: If possible, get someone to help you with this step. An extra set of hands makes the job much easier. While one person holds

the two wing panels together in correct alignment, the other person can clean off the excess glue and tape the wing panels tightly together.

□ 2) Optional Step: A 3/8" wide strip of white covering material is supplied to cover the center joint of the wing panels. Remove the clear backing from the covering, and then iron the strip in place. This covering strip has no structural purpose, it simply gives the wing a more finished look.



□ 3) Test fit the assembled wing onto the fuselage. The plywood tab that sticks out from the center leading edge of the wing, fits into a cutout in the front fuselage former. Make sure the wing slides all the way forward, snug against the back of the fuselage former. At the rear, align the wing with the fuselage, and then use the two 4-40 x 1" nylon wing bolts to secure the wing in place on the fuselage. After checking the fit, remove the wing for the next step.



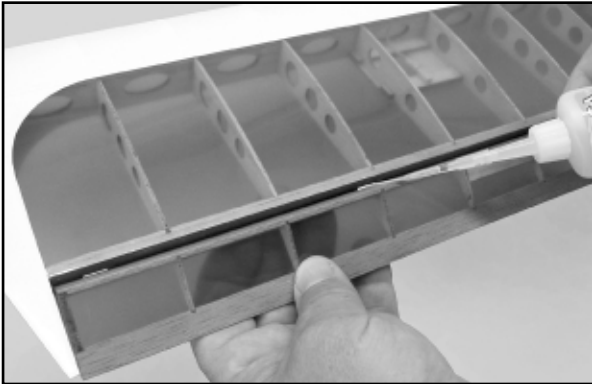
□ 4) As received, the ailerons are only temporarily attached to the wing with unglued CA hinges in the pre-cut slots. In this step, we will glue the aileron hinges permanently in place.

a) Working on one aileron at a time, first push the aileron up firmly against the back of the wing. Check to make sure the aileron is centered in the wing opening. Next set the proper amount of gap between the aileron and the wing by deflecting the aileron about 45° each way. This will automatically set the proper hinge gap. Keep in mind that for best control response the gap should be as small as possible, but big enough to allow full movement of the aileron. Make sure everything is functioning properly before proceeding to the next step.

b) With a fine applicator tip on your glue bottle, carefully place 2-3 drops of Thin CA glue directly onto the hinge in the gap. You will notice that the glue wicks into the wood and the hinge. Quickly turn the part over and apply 2-3 drops of glue to the other side of the hinge. Continue this process until you have glued both sides of all the aileron hinges. Keep a rag handy to wipe off any excess Thin CA glue. (If you get some glue smears on the plastic covering, don't worry about them right now. Once all the hinges are glued, you can go back to clean the smears off with a little CA Debonder on a rag or paper towel.

c) Let the glue dry a minimum of 10 minutes before flexing the hinges. At first, you might notice a little stiffness in the joint. This will go away after the hinges have been flexed back and forth a couple dozen times.

d) Repeat steps a, b, and c to hinge the other aileron.

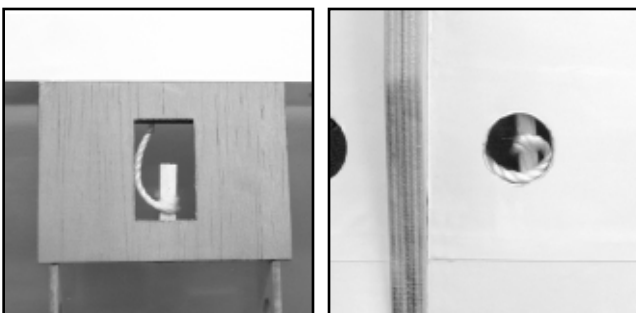


VERY IMPORTANT: It's critical that you only make one application of glue to each side of a CA hinge. If you apply additional glue to the hinge after the first application of glue is already dry, the second application of glue will merely puddle in the hinge gap and make the hinge too stiff to operate properly. The excess glue can also weaken the hinge! When properly glued, the portion of the hinge that you see in the hinge gap should have a dry appearance, not wet. A dry appearance indicates that almost all of the glue has properly soaked into the hinge and wood. A wet appearance indicates that excess glue is puddled in the hinge gap. Excess glue can become brittle with age and cut the hinge. Also, NEVER USE CA ACCELERATOR (KICKER) ON CA HINGES!

AILERON HOOKUP

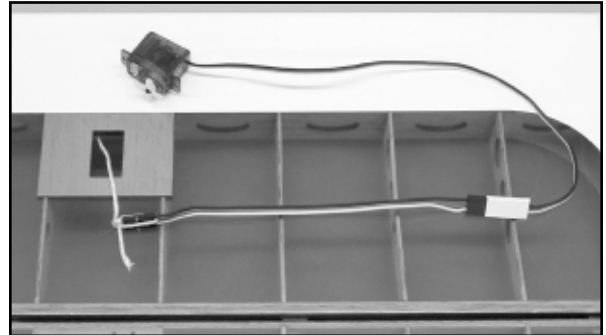
For this section you will need the assembled wing, 2 aileron servos and appropriate chords (see radio notes at beginning of this book), 2 aileron pushrods (the short ones), 2 nylon control horns, and 2 nylon pushrod keepers.

□ 5) Looking into the aileron servo mount opening in the bottom of the wing, you will find a short length of scrap wood with a string tied to it. The other end of this string is tied to another piece of scrap wood in the round hole near the center of the wing. This string is used to pull the aileron servo chord through the wing, from the servo mount towards the center section, in the following steps.

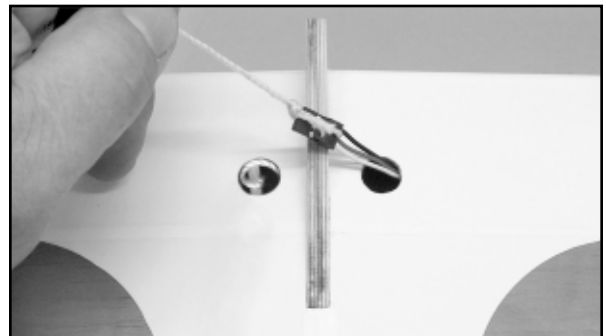


a) Working on one aileron at a time, plug a 6" servo extension chord onto the end of your aileron servo wire. Secure this connection with a piece of plastic tape.

b) With a needle nose pliers, grasp hold of the scrap wood in the servo mount opening. Gently break the wood loose from the wing structure, and then pull the wood and string a couple inches out of the opening. Untie the string from the wood piece and retie it securely to the end of your aileron servo chord.

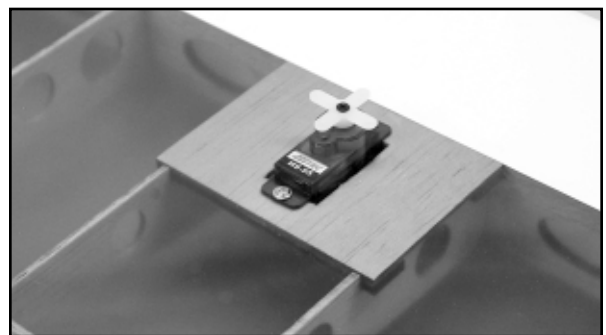


c) Now break loose the other end of the string at the center of the wing, and carefully begin pulling the end of the aileron chord down into the servo mount opening and through the wing. You will encounter obstructions as the servo plug bumps into the rib structure inside the wing. When you do, don't pull too hard on the string! You will find that by gently tugging back and forth alternately on the string at the center and then on the servo chord at the opening, that you can eventually work the plug past the obstructions. Keep feeding the servo chord through the wing until the end plug comes out the hole at the center of the wing. Remove the string from the end of the servo chord and use a piece of tape to hold the chord to the wing for now (so it can't fall back in the hole).



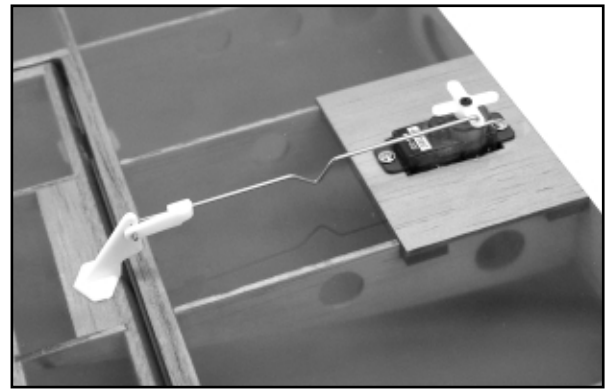
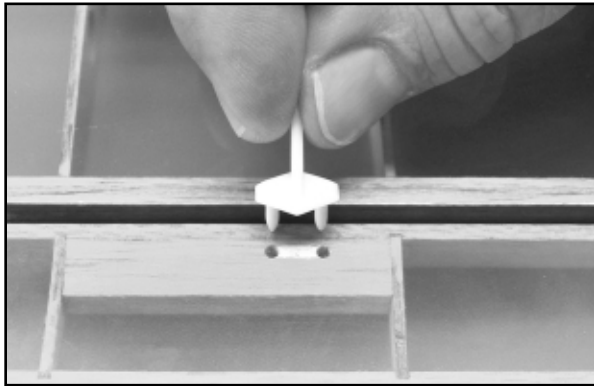
d) Mount the aileron servo in the wing, using the screws that came with the servo.

e) Repeat these steps to install the other aileron servo in the other wing panel.



□ 6) Note that there are two holes pre-drilled in the bottom of the aileron, under the covering material, for the control horn mounting. Puncture the covering material directly over these two holes to accept the two "pegs" of the control horn. Use a sharp knife to

remove the small strip of covering material between the two holes. Then glue the nylon control horn in place using thick CA glue. Apply a small amount of glue to the two pegs and a small amount of glue to the bottom of the control horn base itself. With the three small holes in the control horn facing forward, firmly press the horn into the two pre-drilled holes in the aileron, until the base bottoms out on the elevator surface. If any glue oozes out onto the covering, it can be easily removed with SIG CA Debonder.



NOTE: Later, when you turn on your full radio system for the first time, you may find that the length of the aileron pushrod wires did not come out exactly perfect, leaving the ailerons slightly out of neutral position. If so, you can make small corrections to the overall pushrod length by slight tweaking of the V-shaped adjustment bend that is provided in the middle of the pushrod wire.

FUSELAGE

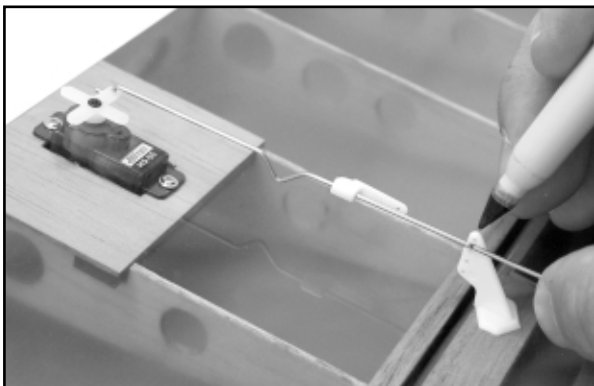
For this section you will need the fuselage, the elevator pushrod wire, the rudder pushrod wire, and 2 servos.

□ 7) In preparation for installing the aileron pushrods, center the aileron servo output arms in neutral position. Also, secure the ailerons in neutral position with small pieces of tape.

a) Working on one aileron at a time, slide one of the nylon pushrod keepers over the plain unbent end of the aileron pushrod wire.

b) Insert the Z-bend end of the aileron pushrod wire into the outermost hole of the servo output arm (if the holes in your servo arm are too small for the wire, drill out the holes with a #60 or 3/64" dia. drill bit)..

c) Hold the pushrod wire against the side of the nylon control horn and use a fine tip pen to mark the exact position of the control horn hole on the wire. Note: The wire will be installed in the 2nd hole from the end of the horn.



d) Use a pair of pliers to grasp the pushrod wire at the mark just made, and then bend the plain end of the wire 90° towards the center of the wing. Make the bend as sharp as possible.

e) The excess length of pushrod wire can now be cutoff, leaving a 3/16" end leg to pass through the control horn hole. Use a good sharp pair of wire cutters to do this. Clean off any burrs on the end of the wire, caused by the cutting.

f) Insert the bent end of the pushrod wire into the hole in the control horn. Slide the nylon pushrod keeper up to the control horn and snap its tab end over the exposed wire on the opposite side of the control horn.

g) Remove the pieces of tape holding the aileron in neutral position.

h) Repeat these steps to bend and install the other aileron pushrod on the other side of the wing.

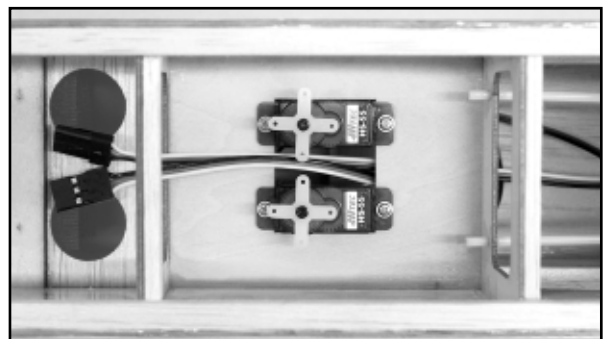
□ 8) Remove the Battery Hatch from the bottom of the fuselage in preparation for mounting the elevator and rudder servos. Note that there is a molded plastic latch built into the front of the hatch. Simply turn the plastic latch 90° and remove the hatch.

□ 9) Mount the elevator and rudder servos in the fuselage, using the screws that came with the servos.

a) Begin by positioning the servos in place in the plywood servo tray built into the fuselage. Note in the picture that the servos should be located out against the sides of the opening in the plywood tray, so that the ends of the servo arms line up with the plastic pushrod tubes already installed in the fuselage.

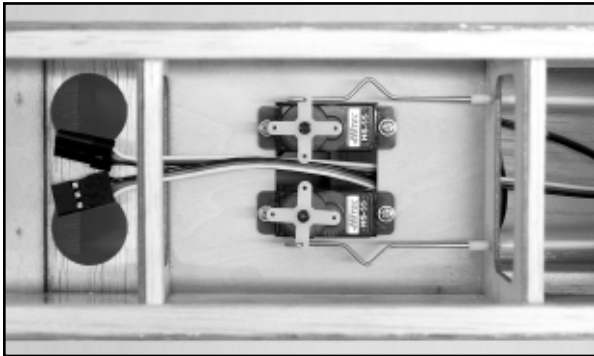
b) Once you have the servos correctly positioned, drill small pilot holes through the plywood for each servo mounting screw - we used a small pin vise and a .040" (#60) drill bit to make these pilot holes. Then use a small screwdriver to install the servo mounting screws.

c) Working through the opening in the bottom of the fuselage, route the two servo leads back to the top of the radio compartment by passing them between the two servos.



□ 10) Determine which of the long pre-bent pushrod wires is for the elevator (right side) and which is for the rudder (left side). Notice in the next picture that the Z-bend in the end of the pushrod will be installed up through the bottom of the servo arm, and that the V-shaped adjustment bend goes towards the outside of the fuselage. Using these two criteria, you can determine which pushrod is for the elevator and which is for the rudder. Once you've got them properly identified, slide the pushrod wires inside the appropriate plastic pushrod tubes in the fuselage.

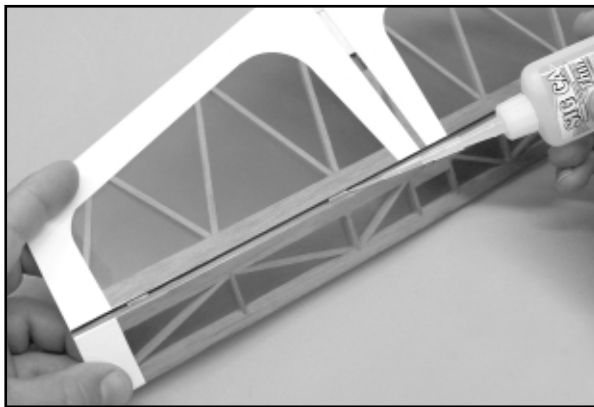
□ 11) Remove the servo arms from the servos. Install the servo arms on the Z-bend ends of the pushrod wires (if the holes in your servo arm are too small for the wire, drill out the holes with a #60 or 3/64" dia. drill bit). Then reinstall the servo arms back onto the servos - do not tighten the servo arm screws completely yet because the arms may have to be repositioned when the radio system is tested and centered.



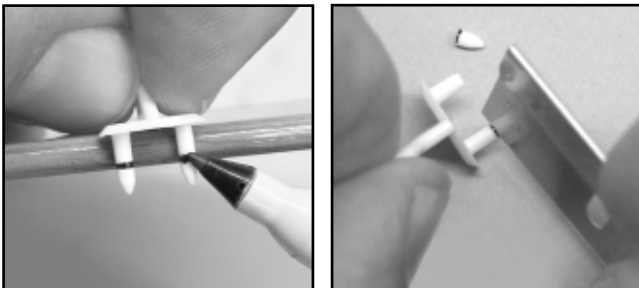
TAIL SURFACES

For this section you will need the horizontal stabilizer/elevator assembly, the vertical fin/rudder assembly, and 2 nylon control horns.

□ 12) As received, the elevator is only temporarily attached to the stabilizer with 4 unglued CA hinges in the pre-cut slots. Refer back to page 3, step 4 of this manual for instructions on gluing CA hinges, and use the same procedures described there to glue the elevator hinges permanently in place. Let the glue dry a minimum of 10 minutes before flexing the hinges.

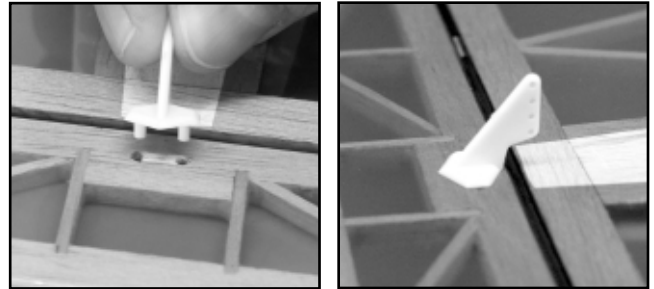


□ 13) Hold one of the white plastic control horns up against the edge of the elevator. Use a fine tip pen to mark the two pegs on the base of the control horn for cutting off just below the top covering of the elevator. Then use a sharp razor blade or hobby knife to cut off the pegs at the marks.



□ 14) Note that there are two holes pre-drilled in the center of the elevator, under the covering material, for the control horn mounting.

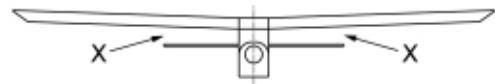
Puncture the covering material directly over these two holes, on the BOTTOM of the elevator only, to accept the two "pegs" of the control horn. Use a sharp knife to remove the small strip of covering material between the two holes. Then glue the nylon control horn in place on the BOTTOM of the elevator, using thick CA glue. Apply a small amount of glue to the two pegs and a small amount of glue to the bottom of the control horn base itself. With the three small holes in the control horn facing forward, firmly press the horn into the two pre-drilled holes in the elevator, until the base bottoms out on the elevator surface. If any glue oozes out onto the covering, it can be easily removed with SIG CA Debonder.



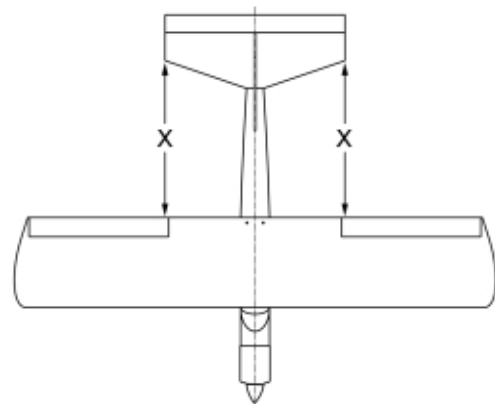
□ 15) Next, the horizontal stabilizer/elevator assembly is glued permanently onto the fuselage. To allow enough time to properly align the stabilizer, we recommend using slow drying SIG Epoxy Glue for this step.

a) Begin by first mounting the wing to the fuselage using the provided 4-40 x 1" nylon wing bolts. Place the model on a flat surface that lets you view it directly from the front.

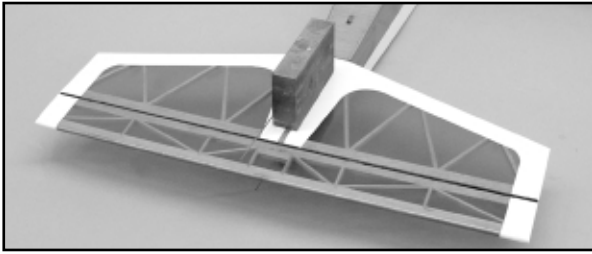
b) Set the stabilizer in place on the fuselage. Use a small weight or pins to hold the stabilizer in position. View the model from the front to see if the stabilizer is properly aligned with the wing and fuselage, without tilting to one side or the other. If necessary, take the stabilizer back off and make slight adjustments to the fuselage where the stabilizer sits, with a sanding block, until the stabilizer will sit level.



c) Remove the stabilizer. Mix a small amount of epoxy glue and apply it to the mating surfaces of the fuselage and bottom of the stabilizer. Carefully place the stabilizer back on the fuselage. Again use a small weight or pins to hold it in position. Make sure the stabilizer is square with the fuselage by measuring from the



trailing edge of the wing back to the leading edge of the stabilizer, on both sides. Shift the stabilizer slightly if necessary until both measurements are the same. Wipe off any excess glue using a paper towel or rag soaked in rubbing alcohol. Allow the glue to dry.



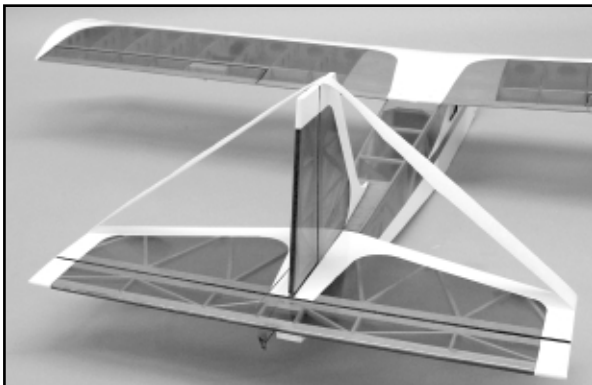
□ 16) As received, the rudder is only temporarily attached to the fin with 3 unglued CA hinges in the pre-cut slots. Refer back to page 3, step 4 of this manual for instructions on gluing CA hinges, and use the same procedures described there to glue the elevator hinges permanently in place. Let the glue dry a minimum of 10 minutes before flexing the hinges

□ 17) Mount a nylon control horn on the LEFT SIDE of the rudder. Refer back to steps 13 and 14, where we cut off the pegs of a control horn and glued then glued the horn to the elevator - use the same steps to prepare and install the control horn for the left side of the rudder.

□ 18) The fin and rudder assembly is now glued in place on top of the stabilizer and fuselage, again using SIG Epoxy Glue.

a) First trial fit the fin/rudder in place, without any glue. If needed, make adjustments to the bottom of the fin to allow full contact with the top of the stabilizer and the fuselage.

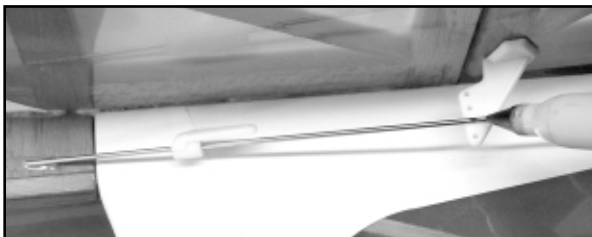
b) Mix a small amount of glue and apply it to the bottom edge of the fin and to the sides of the fin leading and trailing edge stubs. Carefully set the fin/rudder assembly in place on the fuselage. Make sure that the fin is 90° to the horizontal stabilizer. Use low-tack masking tape to hold the fin in correct position. Wipe off any excess epoxy using alcohol and paper towel. Let the glue dry.



□ 19) Now we complete the aft end of the rudder pushrod. Start by centering the rudder servo output arm in neutral position. Use a small piece of tape to hold the rudder in neutral position.

a) Slide one of the nylon pushrod keepers over the aft end of the rudder pushrod wire.

b) Hold the rudder pushrod wire against the side of the nylon control horn and use a fine tip pen to mark the exact position of the control horn hole on the wire. Note: The wire will be installed in the 2nd hole from the end of the horn.



d) Use a pair of pliers to firmly grasp the pushrod wire at the mark just made, and then bend the plain end of the wire 90° UPWARDS. Make the bend as sharp as possible.

e) The excess length of pushrod wire can now be cutoff, leaving a 3/16" end leg to pass through the control horn hole. Use a good sharp pair of wire cutters to do this.

f) Insert the bent end of the pushrod wire in the hole in the control horn, from the bottom. Then slide the nylon pushrod keeper up to the control horn and snap its tab end over the exposed wire.

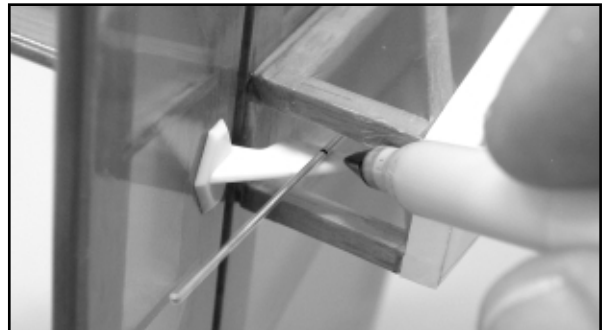
g) Remove the tape holding the rudder in neutral position.



□ 20) Now we complete the aft end of the elevator pushrod. Start by centering the elevator servo output arm in neutral position. Use a small piece of tape to hold the elevator in neutral position.

a) Slide one of the nylon pushrod keepers over the aft end of the elevator pushrod wire.

b) Hold the aft end of the elevator pushrod wire against the side of the nylon control horn and use a fine tip pen to mark the exact position of the control horn hole on the wire. Note: The wire will be installed in the 2nd hole from the end of the horn.



c) Temporarily remove the elevator servo output arm from the servo. This will allow you to pull the elevator pushrod farther outside the rear of the fuselage, to make the next step easier to do.

d) Use a pair of pliers to firmly grasp the pushrod wire at the mark just made. Look inside the fuselage to make sure that the Z-bend end of the pushrod is parallel to the jaws of your pliers. What we're getting ready to do is bend the aft end of the pushrod wire 90° SIDEWAYS to the fuselage - meaning, sideways when the servo arm is re-installed on the servo. If needed, readjust your grip on the wire so that you can bend the wire in the right direction. When ready, bend the aft end of the pushrod wire 90°. Make the bend as sharp as possible.



- e) The excess length of pushrod wire can now be cutoff, leaving a 3/16" end leg to pass through the control horn hole. Use a good sharp pair of wire cutters to do this.
- f) Remove the tape holding the elevator in neutral position.
- g) Insert the bent end of the pushrod wire in the hole in the control horn. Then slide the nylon pushrod keeper up to the control horn and snap its tab end over the exposed wire.
- h) Re-install the elevator servo arm on the servo.

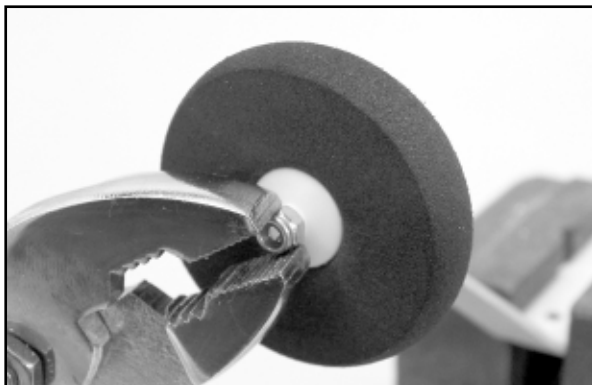
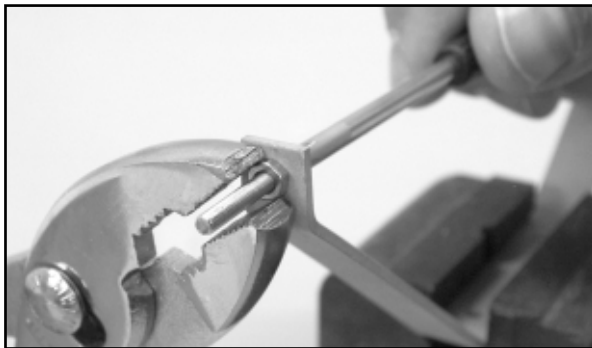


NOTE: Later, when you hook up and turn on your full radio system for the first time, you may find that the length of the elevator and rudder pushrods did not come out exactly perfect, leaving the control surface slightly out of neutral position. If so, you can make small corrections to the overall pushrod length by slight tweaking of the "V-shaped adjustment bend" that is near the servo end of the pushrod.

LANDING GEAR

For this section you will need the aluminum landing gear, two main wheels, two M3 x 20mm axle bolts, two M3 hex nuts, two M3 lock nuts, and two M2.6 x 10mm screws.

- 21) Install the M3 x 20mm axle bolts and M3 hex nuts onto the aluminum landing gear legs. Tighten securely. **Note:** If you have some Loctite Thread Locking Compound® around your shop, use some here to eliminate any chance of the axles ever coming loose in flight.



- 22) Slip the main wheels onto the axle bolts and then thread on the M3 lock nuts. Screw the lock nuts up close to the wheels, but not actually touching them. Leave a little room so the wheels can turn freely.



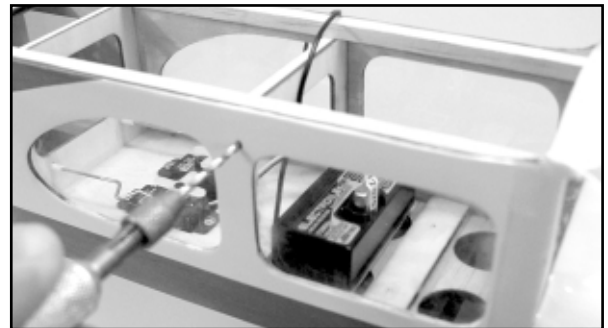
- 23) Attach the assembled landing gear to the fuselage bottom using the two M2.6 x 10MM screws supplied. Notice that two holes are pre-drilled in the bottom of the fuselage at the landing gear location to accept the screws.

RADIO INSTALLATION

For this section you will need the 30amp ESC and the piece of Velcro® Tape from the kit contents, plus your micro receiver and battery pack (see notes at the beginning of this manual about receiver and battery specifications).

RECEIVER

- 24) Mount the receiver to the radio platform built into the fuselage, using a piece of Velcro® tape. Mount it just ahead of the fuselage former that is in front of the servos.



- 25) Route the receiver antenna out of the fuselage. First drill a small hole through the right fuselage side, just below the wing saddle and just in front of the fuselage former separating the servo and receiver compartments. Then pull the antenna through this hole and extend it back to the tail end of the fuselage.

- 26) To hold the antenna at the rear of the fuselage, use a pair of needle nose pliers to make a small wire hook with a loop at one end out of a straight pin (not supplied). Glue the hook to the rear of the fuselage, beneath the stabilizer, using a little thick CA. Then use a small rubber band (not supplied) to cinch the antenna to the wire hook.



□ 27) Earlier you routed the elevator and rudder servo leads up between the servos to the top side of the radio platform. Plug these two leads into the appropriate slots in your receiver. Also plug your aileron Y-harness into the aileron slot of the receiver.

ESC

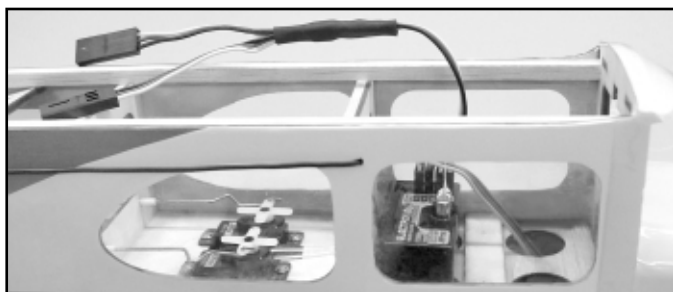
□ 28) Working through the opening in the bottom of the fuselage...
 a) Connect the ESC to the motor, being very careful to get the polarity correct (red to red, black to black).

b) Route the ESC's receiver connector up through one of the holes in the front of the radio platform. Plug it into the receiver's throttle position.

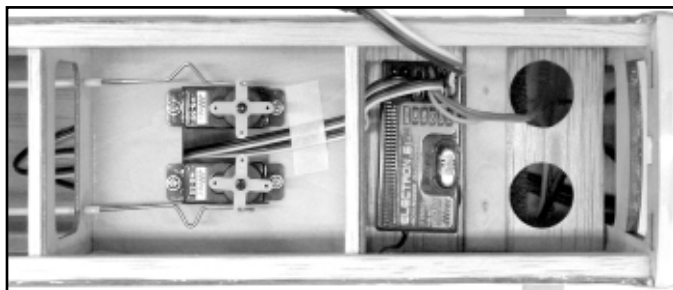
c) Mount the ESC's on/off switch in the opening provided in the left side of the fuselage, below the color trim stripe.



d) Stuff the bulk of the ESC forward into the bottom of the nose compartment of the fuselage. The ESC does not need to be fastened down, it can simply float free in the nose. DO NOT wrap the ESC in foam or plastic. It must be left fully exposed to allow it to stay cool.

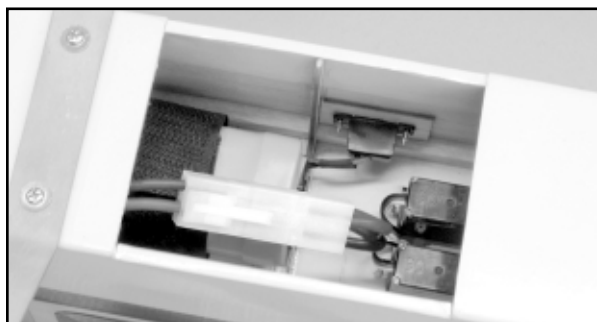


TYPICAL FINISHED RADIO INSTALLATION



BATTERY PACK

□ 29) When you are ready to fly, the battery pack is inserted through the bottom opening of the fuselage and secured to the bottom of the radio platform with the Velcro® tape that is already mounted there. Note that the battery location is very close to the recommended balance point of the airplane. This means that battery packs of different weights can be tried without adversely affecting the overall balance of the airplane. The use of Velcro® makes the battery pack easy to remove for re-charging between flights.



SYSTEM TESTS

□ 30) The completed radio and motor systems can now be powered up and tested for proper operation.

a) Make sure your transmitter aileron, elevator, and rudder trim levers are in neutral position and that the throttle stick is in the full "low throttle" position. Then turn on your transmitter.

b) Install a charged battery pack inside the fuselage. Making very sure of the correct polarity of the connectors, plug the battery pack into the ESC. Then turn on the airborne on/off switch.

□ 31) The elevator and rudder servos should now be working.

a) Move the transmitter sticks and check for correct direction of servo movement. Use the servo-reversing feature of your transmitter, if needed, to make the servos move in the correct direction.

b) If necessary reposition the servo output arms on the elevator and rudder servos as close to 90° to the servo case as possible. Be sure to reinstall the output arm retaining screws after making the adjustment.

c) With the radio still on and the servo arms squared up, note the exact positions of the elevator and rudder. Adjust the V-bend in the pushrods, if necessary, to get the control surfaces properly centered.

□ 32) Set the wing in place on the fuselage, plugging the aileron servo chords into the Y-harness in the fuselage.

a) Move the transmitter aileron stick and check for correct direction of movement. Use the servo-reversing feature of your transmitter, if needed, to make the ailerons move in the correct direction.

b) If necessary reposition the output arms on the aileron servos as close to 90° to the servo case as possible. Be sure to reinstall the output arm retaining screws after making the adjustment.

c) With the radio still on and the servo arms squared up, note the exact positions of the ailerons. Adjust the V-bend in the pushrods, if necessary, to get the ailerons properly centered.

□ 33) **Note:** The propeller and spinner should NOT be installed on the motor for this initial test - for safety!

a) Slowly advance the throttle stick on the transmitter. The motor should start turning. If not, your throttle channel need to be reversed on the transmitter.

b) Now make sure the motor shaft is moving in the correct direction. When viewing the fuselage from the rear to the front - as if you were sitting in the cockpit - the motor shaft should turn clockwise when throttle is applied. If not, you've got the polarity of the motor-to-esc or esc-to-battery wiring reversed.

CONTROL THROWS

□ 34) The maximum distance that a control surface moves when you move the transmitter stick to full deflection is normally called the "control throw" or "control travel". Most modern radio systems allow you to adjust the control throw of the servos directly from the transmitter. This radio feature is usually referred to as EPA, or end point adjustment. Use this feature to adjust the control movements for the ailerons, elevator, and rudder of your KADET EP-42. The following control movements are recommended for your initial flights.

RECOMMENDED INITIAL CONTROL THROWS

- Ailerons: 5/16" up, 5/16" down
- Elevator: 7/16" left, 7/16" right
- Rudder: 5/8" up, 5/8" down

Note: These measurements are always taken at the widest part of the control surface, at their trailing edges.

MOUNTING THE PROPELLER AND SPINNER

□ 35) For this section you will need the propeller and spinner assembly from the kit contents.

a) Remove the molded plastic prop shaft adapter rings from the spinner bag - note there are four different sizes. Try each adapter ring on the threaded prop shaft until you find the one that fits tight. Cut that ring from the molding and slip it onto the prop shaft, as far back as it will go, right up against the motor's prop flange.

b) Fit the spinner backplate onto the prop shaft and over the adapter ring.

c) Install the propeller on the prop shaft, up against the spinner backplate.

d) Thread on the prop nut, screwing it finger tight up against the prop. **Note:** Don't tighten the prop nut completely at this point. You need to be able to shift the prop position in the next step.

□ 36) Carefully study the grooves in the spinner backplate and the corresponding flanges on the back edge of the spinner cone. These grooves and flanges hold the spinner cone in correct alignment with the backplate, so that the 2 mounting screws will install correctly. In other words, the spinner cone can only go on one way - it's location is controlled by the grooves and flanges. Thus the prop position needs to be adjusted to align the prop blades with the openings in the spinner cone.

a) Trial fit the spinner cone and adjust the propeller position as needed to allow the spinner cone to fit in place properly. When everything fits as it should, tighten the prop nut securely.

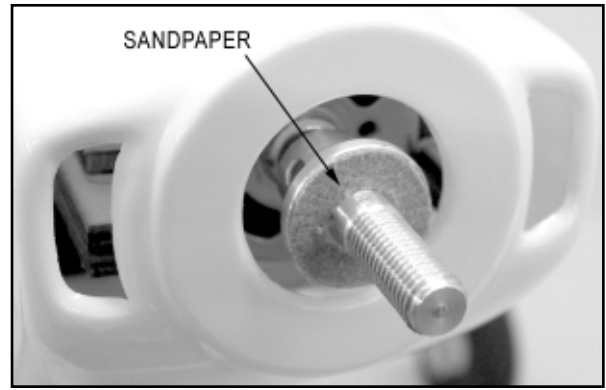


b) Secure the spinner cone in place with the two screws provided. Snug these screws firmly, but don't overtighten them.



Note: When trying to tighten the prop nut, you may find that the spinner backplate keeps slipping against the motor's prop flange, allowing the propeller to slip out of position. If this happens, remove the prop nut, propeller, and spinner backplate, and then glue a small disk of coarse sandpaper (50-100 grit) onto the front

of the motor's prop flange. When dry, reassemble the parts and tighten securely.



SAFETY WARNING: With the propeller mounted to the motor, it is very important that you always remain aware of the position of the throttle stick on your transmitter whenever there is a battery plugged into the airborne system. The motor/geardrive unit used in this model is powerful enough to cause damage to people or property if it is activated prematurely, accidentally, or unexpectedly. With an electric airplane, we recommended that you get in the habit of always keeping the throttle stick in the "low throttle" position, even when the transmitter is in storage. Be sure to recheck the throttle stick position before plugging in the airborne battery pack, and also before turning on the airborne on/off switch. Under no circumstances should you hold this model by the nose when the battery is plugged in or the radio system is turned on. Never plug in your flight battery until you are on the flight line, ready to fly.

DECAL APPLICATION

The decals supplied with the KADET EP-42 are Mylar® stickers with a self-stick adhesive. They are not water slide decals. Also, these decals are not die-cut. Each design must be cut from the sheet with a sharp #11 hobby knife or a sharp scissors.

Small decals can be easily applied to the model by simply removing the paper backing sheet, and then laying the decal in position and pressing it in place with your finger.

For the larger decals, such as the KADET EP-42 wing decal, we suggest the following method of application:

- Carefully cut out the decal with a hobby knife.
- Peel the paper backing sheet completely off the decal, being careful not to let the sticky side double over and adhere to itself.
- Use a product like SIG Pure Magic Model Airplane Cleaner, Fantastic®, or Windex® to spray the adhesive side of the decal. Also spray the area of the model that will receive the decal.
- Lightly place the decal onto the wet surface of the model. The liquid cleaner solution will keep the decal from actually sticking to the model until you have had time to shift it around into



exact position. Once in position, use a piece of stiff cardboard (or sheet balsa, thin plywood, or a SIG SH678 EPOXY SPREADER) to squeegee the excess liquid out from under the decal. Squeegee repeatedly, removing all excess liquid and any air bubbles. Mop up the liquid with a paper towel. Allow to dry overnight.

e) When completely dry, wash off any soapy smears with a soft clean wet rag.

BALANCE YOUR AIRPLANE!

Important: An R/C model should always be balanced with everything on board, ready for flight. The flight battery must be installed in the fuselage, and the propeller and spinner must be mounted in place when balancing the model.

RECOMMENDED BALANCE POINT

2-1/4" (28%) to 2-3/8" (30%)

Behind The Leading Edge Of The Wing

The main wing spar of the KADET EP-42 is located precisely in the middle of this balance range. This means that the simplest way to check the balance of your KADET EP-42 is to place a finger tip, one on each side of the fuselage, at the main spar location on the bottom of the wing. Slowly lift the airplane off the work table and note the attitude of the fuselage. The airplane should balance on your finger tips in level position - not nose up or nose down. If the nose hangs low, the model is "nose heavy". If the tail hangs low, this means that the model is "tail heavy". If either of these conditions exists, you must make adjustments to correct the problem. Never attempt to fly a model that is out of balance! Since the flight battery pack is the single heaviest component in the airplane, it can be used to adjust almost any tail heavy or nose heavy condition. This is simply done by moving the battery forwards or backwards inside the airplane.



FLYING YOUR KADET EP-42

The KADET EP-42 appeals to R/C fliers of all experience levels - from beginners to expert pilots. Assuming that the expert pilots will not need much guidance, these flying notes are written for the R/C newcomer.

PRE-FLIGHT

Be sure your flight battery pack is fully charged. Also be sure your transmitter is fully charged. We highly recommend that you perform a standard range check on your radio system - with and without the motor running. Make sure your propeller is balanced and has no nicks or cracks - never fly with a faulty propeller! Finally, take a few minutes to give your model a thorough pre-flight inspection. Make sure everything is secure and tight and operating properly, before attempting to fly the model. Any problems you have will not magically disappear at the field - they will get worse!

AN INSTRUCTOR CAN SAVE YOUR AIRPLANE !

If you are new to the hobby of flying R/C model airplanes, DO NOT attempt to fly this model by yourself! We strongly urge you to seek the help of a competent flight instructor. There are hundreds of R/C clubs in the U.S., and these clubs normally have designated instructors who are eager to help newcomers. The easiest way to find an R/C flying club in your area is to ask your local hobby shop, or check the AMA (Academy of Model Aeronautics) web site: www.modelaircraft.org

An R/C flight instructor serves two important functions. First, he will test fly your new airplane to make sure it is performing correctly, before you try to fly it. These first flights are called "trim flights". During these flights, the flight instructor will "trim" the model from the transmitter to ensure that it flies straight and level without any problems. When a brand new R/C model takes off for the first time, there is no way of knowing which way it might go. Some models will try to climb, while others may want to go down. Some will try to turn left, others right. Some models will be doing both at the same time! It doesn't mean that there is anything wrong with the model, but these minor differences must be "trimmed out" in order for the model to fly "hands-off" straight and level. An experienced pilot can instantly correct out of trim conditions before the model crashes into the ground. An inexperienced beginner has almost no chance of saving an out of trim model!

The second reason for an instructor is to have someone there to correct the mistakes you will make during the learning process. It isn't that flying an R/C model aircraft is all that difficult. It is more a matter of learning what to do and when to do it. No matter how slowly a model flies, an incorrect control input can produce almost instant problems that, in turn, demand almost instant correction. This is especially true at lower flight altitudes. A good flight instructor will climb your model to an altitude that gives him a good chance of saving your airplane when you make these inevitable mistakes. This altitude is generally referred to as "2 mistakes high". When you get into trouble, quickly hand the transmitter back to your instructor so he can rescue the airplane. He will get it leveled off and then let you try it again. Without an instructor, it is very likely that you would not receive this second chance.

Beginning R/C pilots almost always over-control their models. This is perfectly normal but a trait that must be cured during instruction. Another problem common to beginners is disorientation. For example, when the airplane is flying away from you, right aileron input produces a right turn, and left aileron input produces a left turn. However, when the airplane is flying directly toward you, the same right aileron input now makes the airplane turn to YOUR left. The airplane is still turning to it's right, but that is now your left side! This perceived control reversal is very confusing to all first time R/C pilots! Without an experienced flight instructor on hand, it will most likely cause the loss of the model.

With a flight instructor, these early learning problems can be easily dealt with. The more you fly, the quicker you will learn. Soon you will be flying "solo" with little thought of the moves required. It will start to come easy. Remember the first time you tried to ride a bicycle? It seemed completely awkward the first time, but once you learned how, it became easy. Don't get discouraged if you have a minor crack-up. Repair the damage and get back into the air as soon as possible.

FIRST TEST FLIGHT

Choose a calm day with little or no wind for the KADET EP-42's initial test flights. This is important in getting the model properly trimmed. If there is too much wind, you won't get a true reading on what the model is doing in the air.

The KADET EP-42 is capable of taking off from any smooth surface runway or a closely cut grass field - this is called an ROG (Rise-Off-Ground) take-off. The correct ROG take-off procedure is to line the airplane up with the center of the runway, facing directly into the wind. Advance the throttle smoothly to full high throttle position. As the airplane accelerates, apply a little right rudder input to counteract motor torque and keep the model tracking straight. When sufficient speed is attained, a small input of up elevator will get the model airborne.

The KADET EP-42 can also be easily hand-launched if the grass is too long at your flying field. When hand launching, the airplane must be launched straight and level directly into the wind, with the nose aimed at a point on the ground about 75' in front of you. Never launch the model with the nose pointed up or the wings tipped to one side or the other. The launch should be firm enough to achieve flight speed but yet not overly hard.

Once the airplane is in the air, it should be flown to a reasonable altitude for flight trimming - approx. 100' or so. The transmitter trim levers are then used to trim the model to fly straight and level. Depending upon the altitude of your flying field, the condition of your flight battery, and other factors, you will most likely find that the KADET EP-42 will fly well in level flight at 1/2 to 3/4 throttle setting. This reduced throttle setting will slow the model down, increase your flight duration, and make the model easier to fly for beginners. Note that every time the throttle setting is changed, the elevator trim must also be re-adjusted to make the model fly level.



The KADET EP-42 has very mild stall characteristics - straight ahead with a slight nose drop, resuming flight almost immediately. It can also be banked fairly sharply with little tendency to "fall off".

Landing the Kadet EP is relatively easy. The power-off glide is quite flat and all flight controls remain effective at slow landing approach speeds. Flying into the wind, line up with the center of the runway and gradually throttle back. As the airplane slows down, the nose will drop, allowing the airplane to glide down to the runway. If the glide is too steep and the model is picking up speed, feed in a little up elevator until you get a shallow glide at a constant speed. About a foot or so above the ground, start to flare the landing by carefully feeding in more up elevator a little bit at a time. This will bring the nose up, slowing the airplane even more. Try to hold the airplane just inches off the ground until it finally slows enough to settle smoothly onto the runway.

Caution: Never land your airplane in tall grass or weeds with the motor running. Always throttle back completely if you land in such terrain, or if you nose over after landing. Tall grass or a nose over will stall the motor if it is running. A stalled motor can overheat the ESC and batteries, causing them to fail.

JOIN THE CLUB

Although the KADET EP-42 is considered a "park flyer" and can be flown in fairly confined spaces by accomplished pilots, it should never be flown within five miles of an organized R/C aircraft flying site. This one simple precaution can prevent the loss of your model from radio interference. Do yourself a favor and join your local R/C club - you'll almost always get assistance and good advice, and you will even make a friend or two!

GOOD LUCK AND HAPPY LANDINGS!

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 WEB SITE: www.modelaircraft.org

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SIG MANUFACTURING COMPANY, INC. is committed to your success in both assembling and flying the KADET EP-42. 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.

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