INSTRUCTION MANUAL

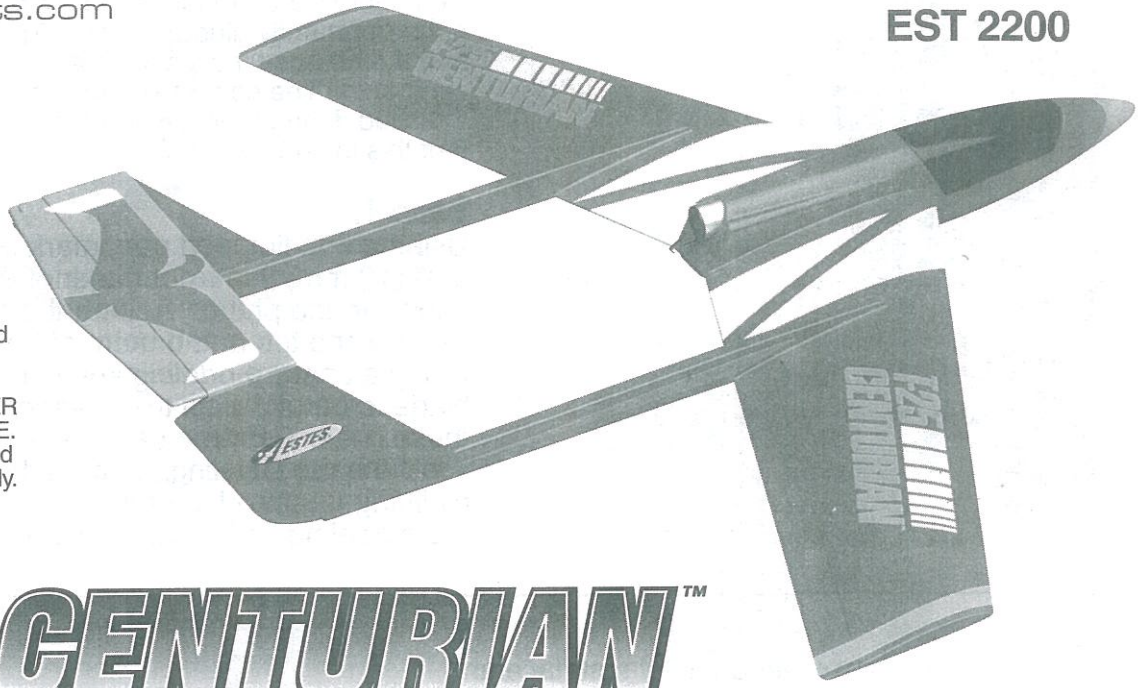
KEEP FOR FUTURE REFERENCE

www.estesrockets.com

EST 2200

Estes® Industries
1295 H Street
Penrose, CO 81240

Printed in China.

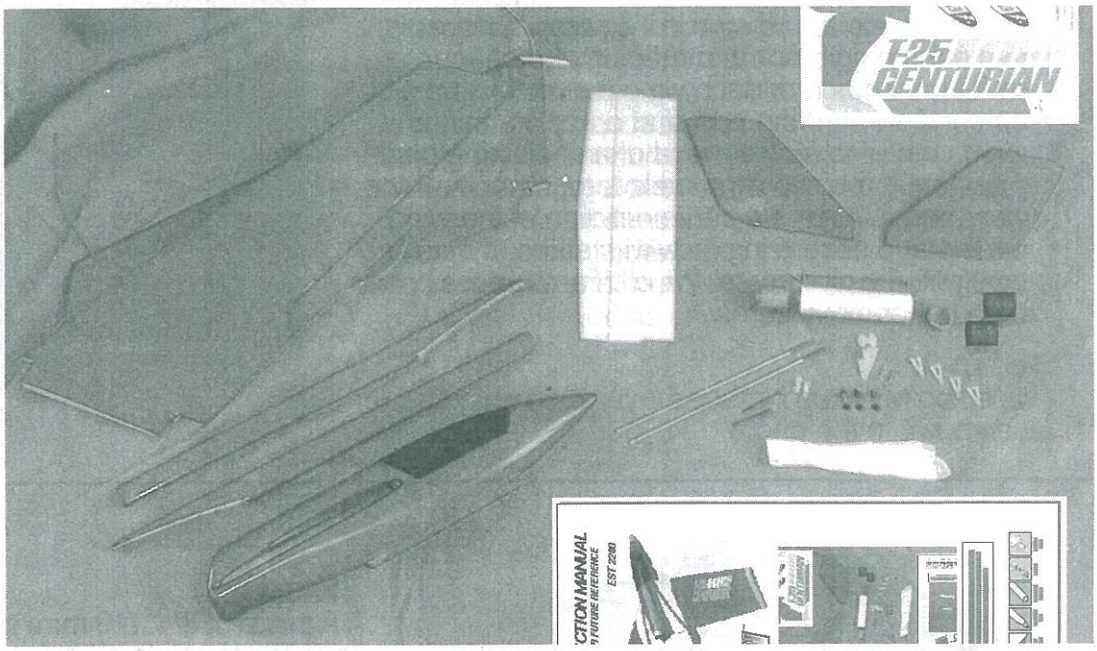


ASSEMBLY TIP
Read all instructions before beginning work on your model. Make sure you have all parts and supplies.

TEST FIT ALL PARTS TOGETHER BEFORE APPLYING ANY GLUE. If any parts don't fit properly, sand as required for precision assembly.

T-25 CENTURIAN™

Fuselage w/Canopy	60233 (1)
Left Vertical Fin	60236 (1)
Right Vertical Fin	60237 (1)
Rear Stabilizer	60239 (1)
Rear Elevator	60498 (1)
Left Tail Boom	60241 (1)
Right Tail Boom	60240 (1)
Left Wing w/Aileron	60243 (1)
Right Wing w/Aileron	60244 (1)
Fiberglass Tape	60194 (1) (.75"x12")
12" x 2-56 Threaded Pushrod	60196 (2)
2-56 Clevis	60197 (4)
Molded Aileron Connector	60483 (2)
Brass Connector w/Set Screw	60484 (3)
Threaded Brass Coupler	60504 (2)
3/16" x 25/32" Wood Dowel	60505 (2)
Control Horn	60506 (1)
#2 x 3/8" Sheet Metal Screw	60507 (2)
Engine Mount Tube	30463 (1)
Engine Hook	35022 (1)
Adapter Ring	30164-2 (1)
Engine Spacer	35005 (1)
Engine Holder Ring	30160 (2)
Decal Sheet	60509 (1)
Instruction Manual	60252 (1)

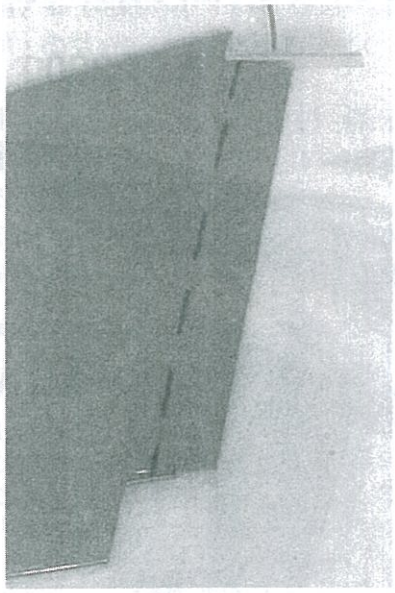


Your T-25 Centurian™ is a technically advanced product. It is important that you read these instructions and pay close attention to the SAFETY PRECAUTIONS AND HELPFUL HINTS. If you do run into something difficult and need some help, just call Estes® Customer Service at 800 451-0339.

SUPPLIES

Slow Cure Epoxy | Ruler | Glue | Knife | Pencil | Wax Paper | Masking Tape | Fine Sand Paper | CA Glue | Soft Tip Pen | Pliers | Solder Gun

WING ASSEMBLY



The control surfaces (ailerons and elevators) of T-25 Centurian™ are pre-hinged at the factory but they are not permanently glued in place. The control surfaces and their hinges must be removed before assembly can begin. The control surfaces will be permanently attached during Step 1 in the Ailerons section on page 6 of this instruction book

Step 1.

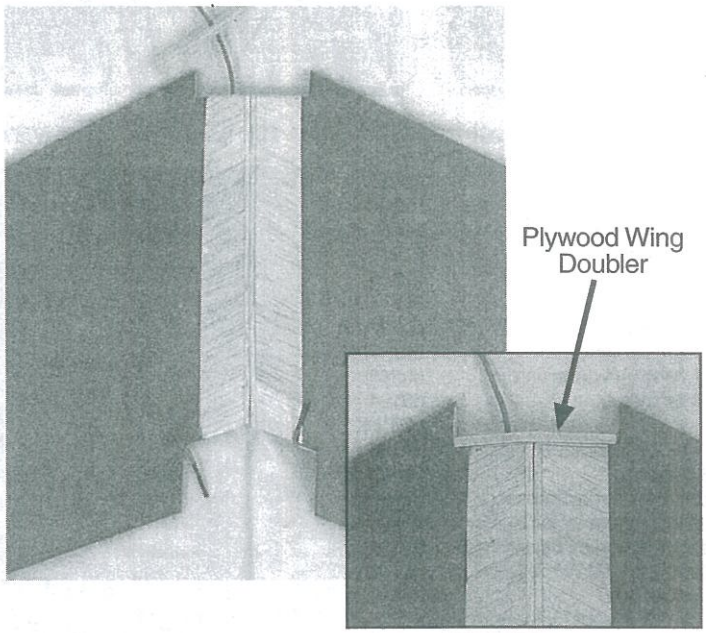
Using a soft tipped pen, mark a line that measures 3/4" (19 mm) in from the end of the wing panel as shown in the photo. Repeat the above procedure to mark the top and bottom of both wing panels. Using a sharp modeling knife or single edge razor blade, carefully slice the covering material along these lines. Extreme care must be taken not to cut into the balsa sheeting. Remove the covering material by lifting up an edge of the covering material with the modeling knife, and peel the covering off.

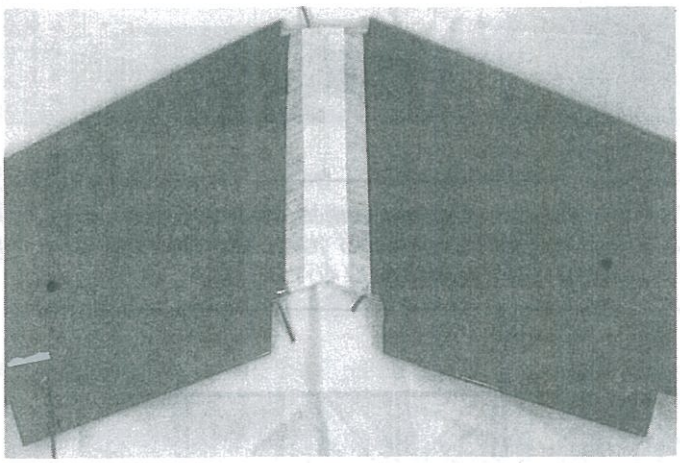
Step 2.

Place a piece of wax paper on a flat surface and place the bottom of the wing panels on the wax paper. Butt the ends of the wing panels together making sure there is a good fit with no gaps between the wing panels as shown in the photo. If necessary, use a sanding block and medium sandpaper to true up the ends of each wing panel. Mix up a batch of slow curing epoxy and apply a thin and even coat of epoxy to the end of each wing panel. Again, butt the two wing panels together over the wax paper. Align the center section of the wing panels and secure in place with strips of masking tape until the glue cures. Wipe off any excess epoxy before the epoxy cures.

Step 3.

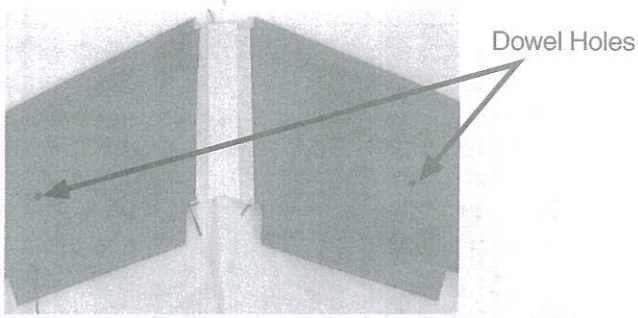
Use epoxy to glue in place the plywood wing doubler as shown in the photo.





Step 4.

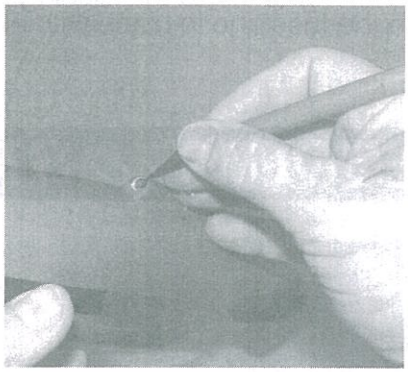
A piece of 3/4" (19 mm) wide fiberglass tape has been provided to reinforce the joint between the two wing panels. Begin by cutting fiberglass tape into two equal length pieces. **DO NOT OMIT THIS STEP.** Apply a thin coat of slow curing epoxy to the top of the wing joint and place the fiberglass cloth onto the joint. Using your finger, rub epoxy glue into the weave of the fiberglass cloth until the weave is completely filled. Remove any excess epoxy with a rubber squeegee or old credit card and allow the glue to cure. Repeat the above procedure to apply the fiberglass tape to the bottom of the wing joint.

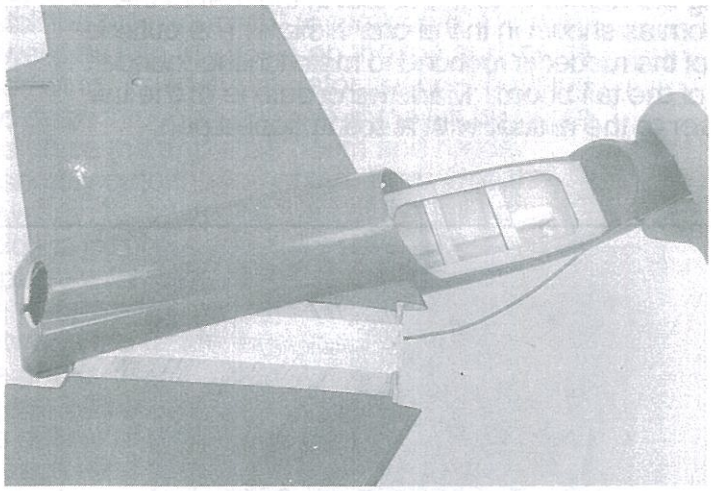


Step 5.
Referring to the photo, gently rub your finger over the top wing surface until you locate the dowel hole in each wing panel. Using a modeling knife with a new blade, remove the covering from the holes.

FUSELAGE ASSEMBLY

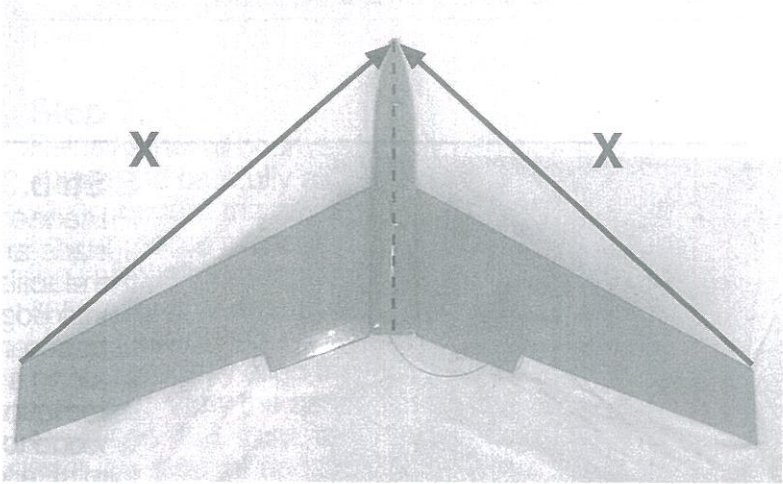
Step 1.
Using a modeling knife, open each end of the launch lug tube located on the bottom of the fuselage. Make these openings smooth and free from any sharp or jagged edges.





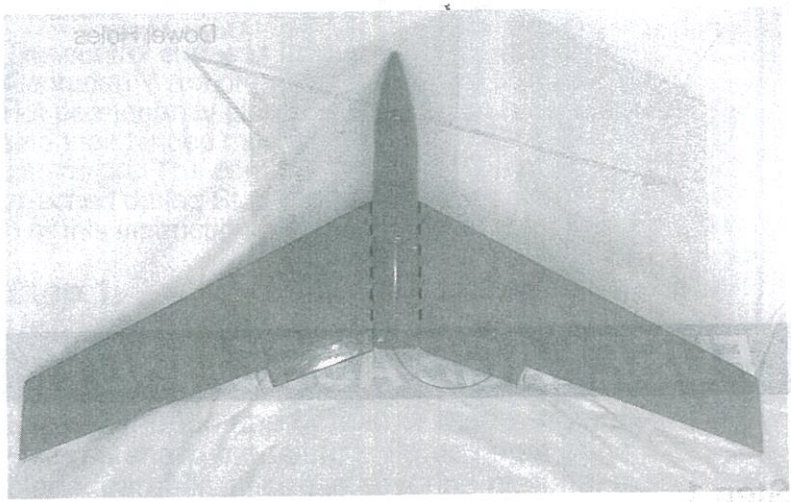
Step 2.
Trial fit the wing into the fuselage. It will be necessary to rotate the threaded end of the aileron torque rods to a horizontal position before sliding the wing into the fuselage. Do not force the wing into the fuselage. The wing should slide smoothly into place. If needed, enlarge the wing opening in the fuselage slightly with medium grit sandpaper. The joint between the fuselage and wing must be as close a fit as possible. Route the elevator pushrod housing and cable through the wing opening and into the radio compartment before the wing is seated in the fuselage.

Step 3.
Using a soft tipped pen, draw a centerline on the bottom of the fuselage as show in the photo. Carefully align the wing to the fuselage by measuring the distance from the end of each wing tip to the centerline at the nose of the model. These distances (X & X) should be the same. If necessary change the position of the wing and/or fuselage until the distances are equal.

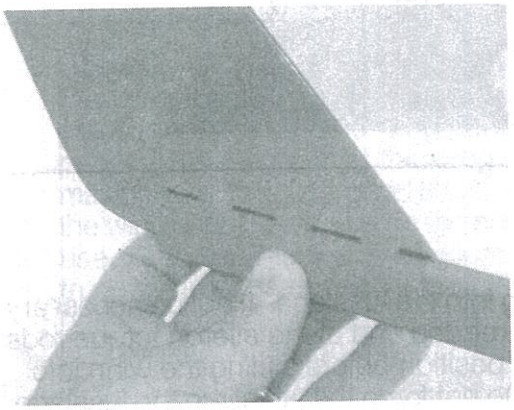


Step 4.

Carefully mark the outline of the fuselage at the wing and fuselage joint on the top and bottom surface of each wing panel. Remove the wing from the fuselage and cut along these lines with a modeling knife and remove the covering material from the wing. Use extreme care not to cut into the balsa sheeting on the wing. Screw the nylon aileron connectors onto the threaded ends of the aileron torque rods until they are flush with the tops of the threaded rods. Reinstall the wing into the fuselage and double check the alignment between the wing and fuselage. Use pieces of masking tape to hold the wing in proper alignment to the fuselage and carefully glue the fuselage in place with gap filling CA glue.



TAIL BOOMS & STABILIZER ASSEMBLY

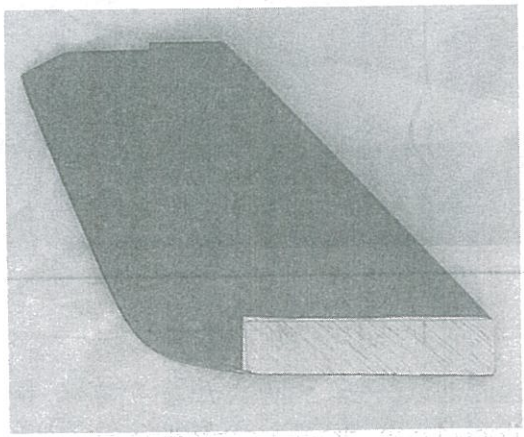


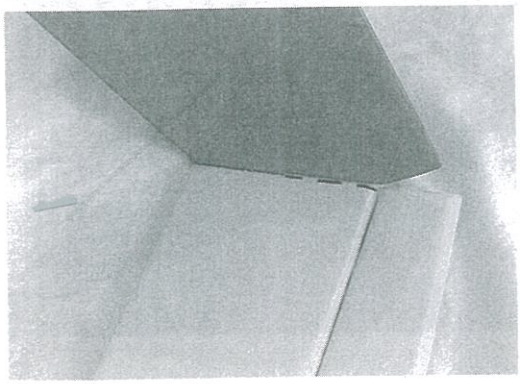
Step 1.

Two tail booms and rudders have been provided and are marked with L (left) or R (right). Begin assembling the left rudder to the left tail boom by placing the rudder onto the cutout in the rear of the tail boom as shown in the photo. Note: The outside edge of the rudder is rounded to match the rounded edge of the tail boom. Mark the outline of the tail boom onto the rudder with a soft tipped pen.

Step 2.

Using a sharp modeling knife, lightly cut along these lines and remove the covering material. Remember, a wood to wood contact makes the best glue joint. Repeat the above Step 1 to remove the covering from the right rudder.



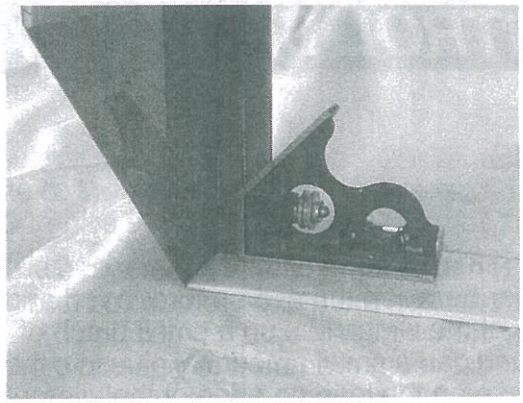


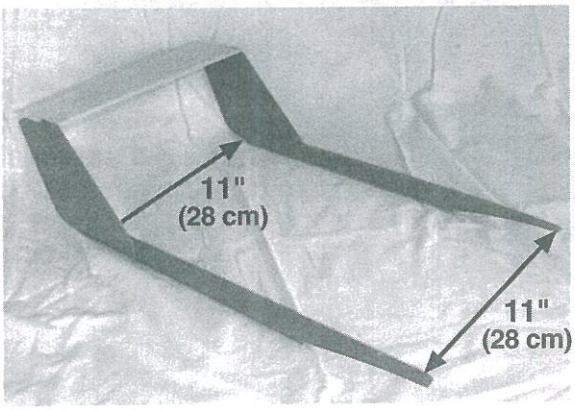
Step 3.

Place the horizontal stabilizer on a flat surface and position the left rudder over the stabilizer notch as shown. Mark the inside edge of the stabilizer with a soft tipped pen and remove the rudder. Cut along this line with a modeling knife and remove the covering material. Again, a wood to wood contact makes the best glue joint. Repeat this step for the right rudder.

Step 4.

Place the stabilizer on a flat surface covered with wax paper. Place the right rudder on the end of the stabilizer notch and glue in place with gap filling CA glue. Use a square and set the rudder 90° to the stabilizer. Make sure that the rudder is seated fully in the stabilizer notch, and allow the glue to cure. Repeat this step to install the left rudder.



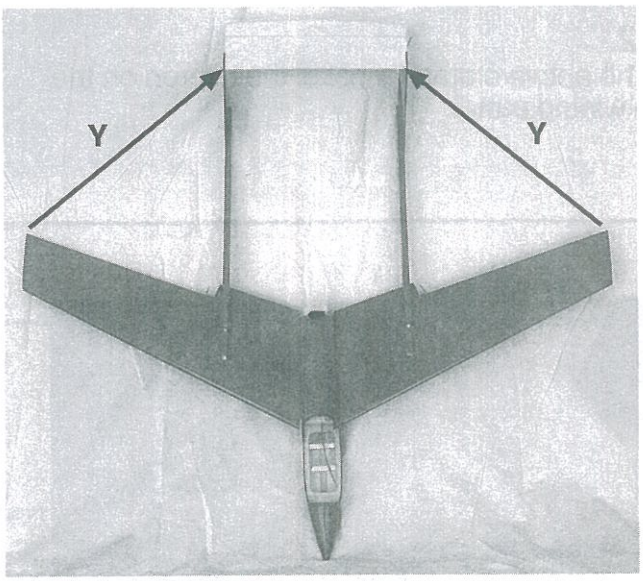


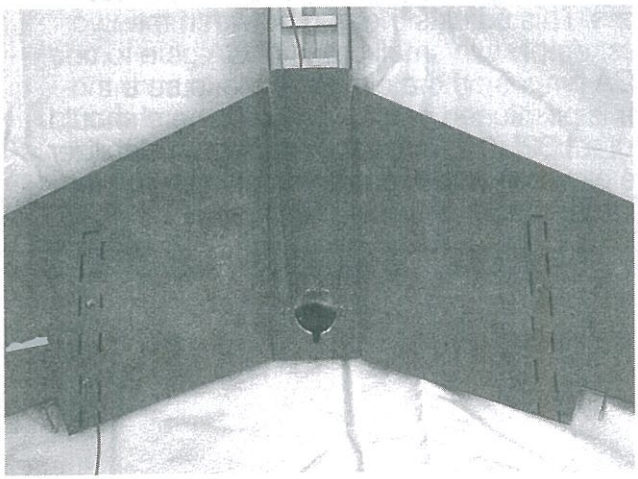
Step 5.

Using straight pins, pin the left tail boom to the inside of the left rudder and the right tail boom to the inside of the right rudder. Carefully align the tail booms and the rudders. The front and the rear of the tail booms should measure 11" (28 cm) in width. When satisfied with the alignment, glue the rudders to the booms with gap filling CA glue.

Step 6.

Install the provided 3/16" (5 mm) x 5/8" (16 mm) dowel pins into the holes on the top surface of each wing. Feed the elevator pushrod housing and cable through the inside of the left tail boom and place the entire tail boom and rudder assembly onto the top of the wing. Use the dowel pin to locate the front of the tail booms. Hold the tail boom and rudder assembly securely in place with strips of masking tape. Measure the distance from each wing tip to the front joint between the rudder and stabilizer as shown in the photo. These distances (Y & Y) must be equal. When satisfied with the alignment, mark the outline of each tail boom on the top surface of each wing panel. Remove the tail boom assembly and carefully cut along these lines and remove the covering material.





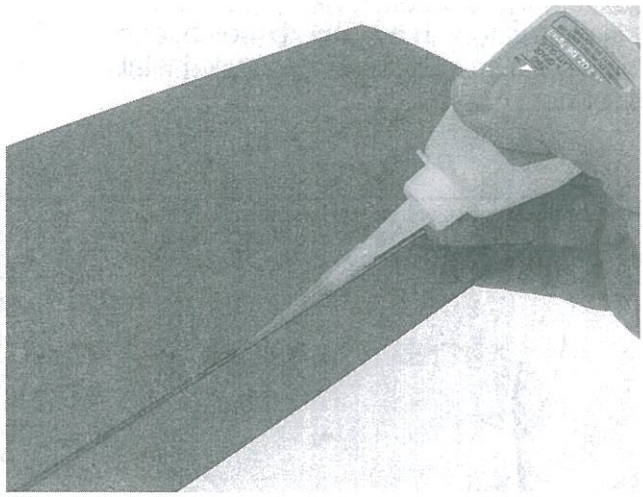
Step 7.

Reinstall the tail boom assembly with slow curing epoxy and carefully align the assembly to the wing. Secure the assembly in place with pins and/or pieces of masking tape. Double check the X & Y alignments between the tail boom assembly and wing and allow the glue to cure. Using slow drying epoxy glue allows plenty of time to properly align the tail boom assembly to the wing. View the assembled model from all directions (top, front, rear, and sides) making sure it is straight and true.

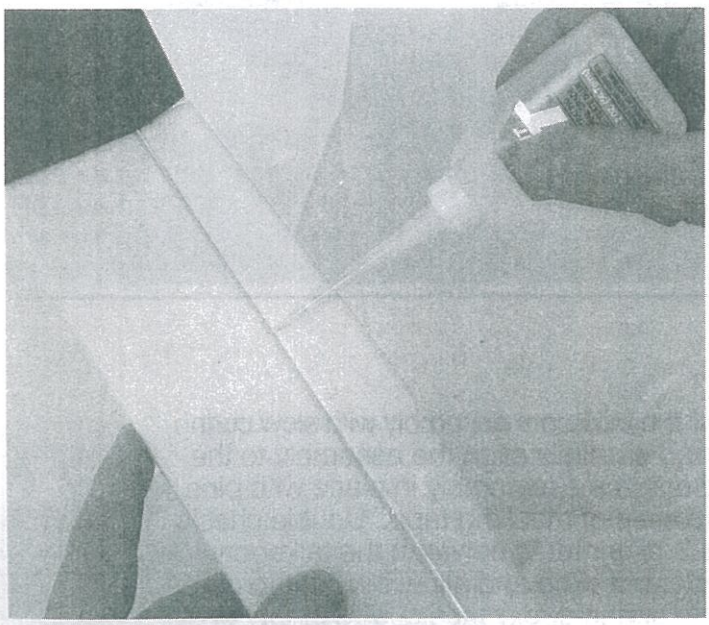
CONTROL SURFACE ASSEMBLY

AILERONS

Step 1.
Cut a 1-1/2" (38 mm) square of wax paper and slip the wax paper between the aileron torque rod and trailing edge of the wing. Mix up a small batch of epoxy glue and dab a small amount of glue into the torque rod hole on the leading edge of the aileron. Install the CA hinges in the slots of the wings trailing edge and install the aileron. Make sure that the torque rod slips into the hole and hinges slide into the slots in the leading edge of the aileron. The leading edge of the aileron should be flush with the trailing edge of the wing. Deflect the ailerons 3/8" (9.5 mm) in both directions and apply two drops of thin CA glue to the bottom of one of the CA hinges. Check and make sure that the aileron is positioned properly and has about a 1/32" (0.8 mm) gap between the trailing edge of the wing and aileron. Add two drops of thin CA glue to the top and bottom of the remaining hinges.



Step 2.
Repeat the above step to install the aileron on the opposite wing panel.



ELEVATORS

Step 1.
Install the CA hinges into the trailing edge of the stabilizer and attach the elevator. Make sure that the elevator is flush with the trailing edge of the stabilizer. Deflect the elevator 3/8" (9.5 mm) in both directions. This adjusts the gap between the two surfaces. Apply two small drops of CA glue to one of the CA hinges on the elevator. Make sure the elevator is positioned properly. Again, there should be about a 1/32" (0.8 mm) gap between the stabilizer and the elevator. Add two drops of thin CA glue to the top and bottom of the remaining hinges.

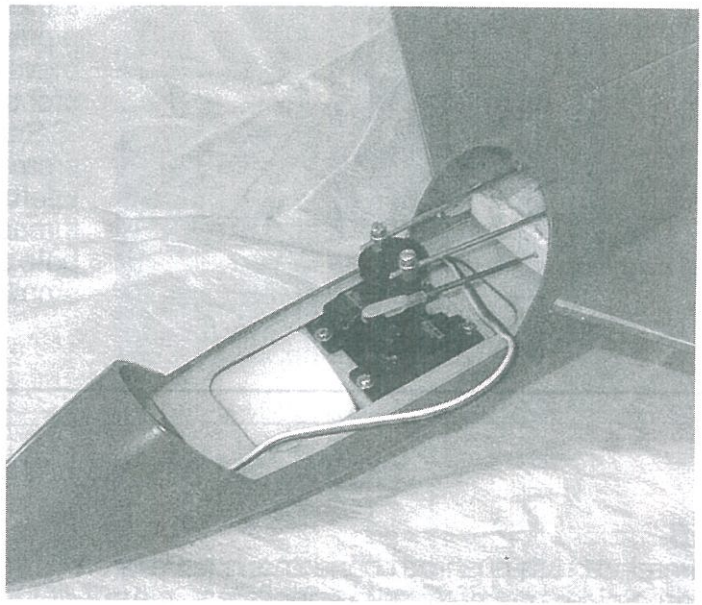
RADIO INSTALLATION

There are several manufactures that produce radio systems that are suitable for the T-25 Centurian™. The smaller "Mini" size servos are needed to fit the compact size of the T-25 Centurian™. We have used the following examples, the Futaba S-133, Hitec HS-81, and Airtronics 94501. In addition, a small flat 250 mha battery pack is required.

AILERON SERVO INSTALLATION

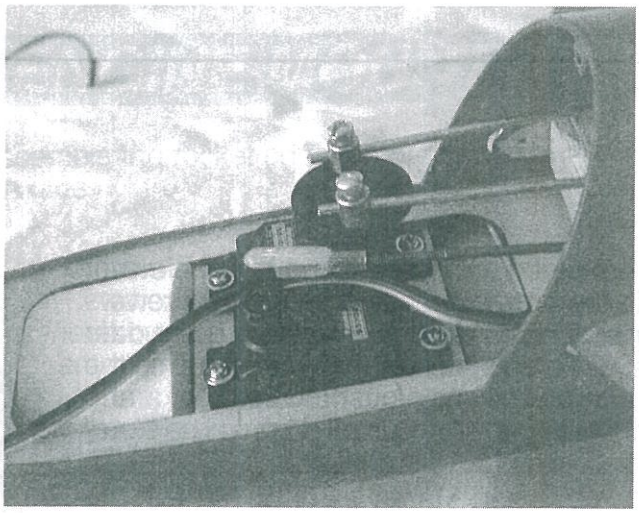
Step 1.

The servo mount is pre-installed at the factory. Make sure the servo mount is properly positioned and securely glued in place. Mount the servos to the mount as recommended by the radio and /or servo manufacturer.



Step 2.

Install two of the provided E/Z connectors to the servo wheel and secure the knurled nut in place with a small drop of thin CA glue. Thread two of the R/C clevises onto two of the threaded end pushrods. Attach the pushrods to the aileron torque rods by passing the pushrods through the back of the canopy opening and attaching the R/C clevises to the nylon aileron connectors. Working room is limited in this area so take your time and make sure the pushrods are connected properly.

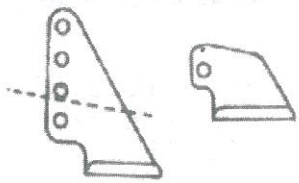


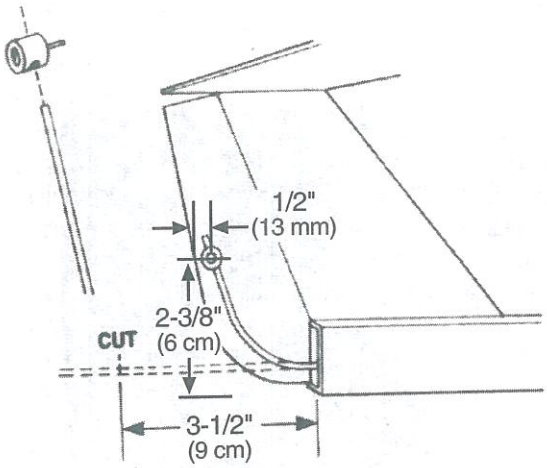
Step 3.

Attach the pushrods to the servo arm by inserting the pushrods into the E/Z connectors on the servo arm. Install the servo arm on the aileron servo output shaft. Place the servo arm and each aileron in the neutral position. Secure the pushrods to the connectors by tightening the phillips head screws. Trim off the excess pushrod 1/2" (12.7 mm) in front of the E/Z connectors.

ELEVATOR SERVO INSTALLATION

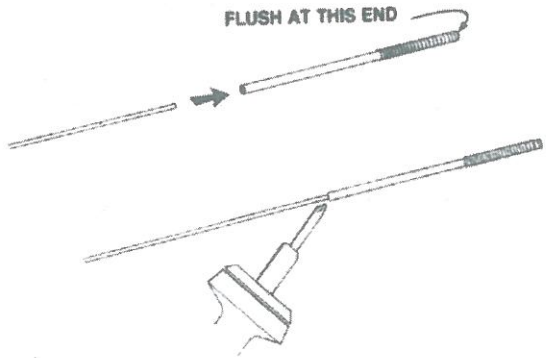
Step 1.
Locate and trim off the molded nylon control horn as shown in the drawing.

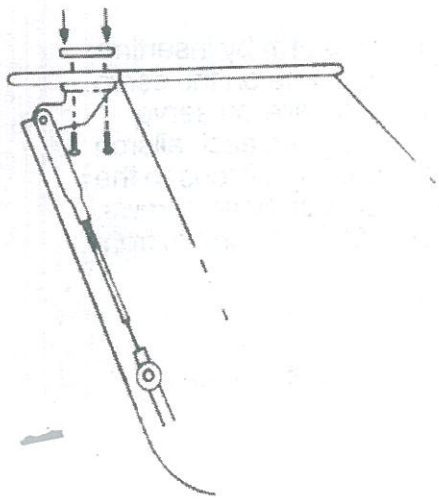




Step 2.
Cut the plastic pushrod housing 3-1/2" (9 cm) from the end of the left tail boom. Note: Do not cut the pushrod cable. Slip one of the brass connectors over the plastic pushrod housing leaving 1/8" (3 mm) of the plastic housing extending past the connector. Secure the plastic housing to the connector with a small drop of thin CA glue. Make a small hole in the left rudder referencing the drawing and insert the threaded end of the pushrod connector into the drilled hole and secure the connector to the rudder with a small drop of thin CA glue.

Step 3.
Two threaded brass pushrod connectors have been provided. Solder one of these connectors to the elevator end of the cable pushrod making sure the cable is flush with the threaded end of the connector.



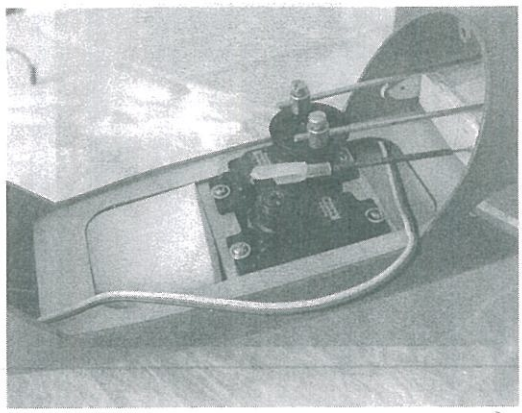


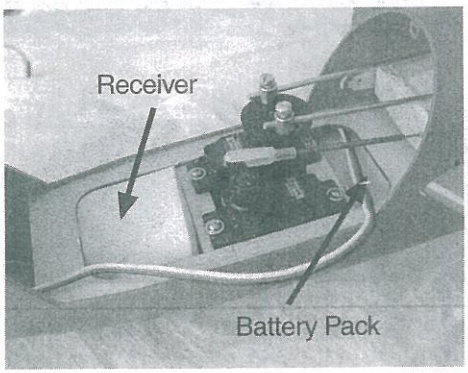
Step 4.
Mount the molded nylon control horn to the elevator as shown in the drawing with the provided screws. The horn should be as close to the side of the rudder as possible. Thread one of the R/C clevises onto the end of the threaded cable pushrod connector and attach the clevis to the nylon control horn. The elevator end of the pushrod is now complete.

Step 5.
Trim off the plastic cable pushrod housing flush with the front of the plywood wing brace. Note: Do not cut the braided pushrod cable. Thread the remaining R/C clevis onto the threaded brass pushrod connector until the clevis is centered in the threads of the brass connector. Attach the R/C clevis and threaded connector to the servo arm. Feed the braided cable pushrod through the brass connector and take up any slack in the cable pushrod. Place a mark on the pushrod cable at the forward end of the brass connector and cut off the excess pushrod cable at that mark. Remove the clevis and solder the brass connector to the cable pushrod with the end of pushrod cable flush with the threaded end on the brass connector. Reattach the R/C clevis to the threaded brass connector and then reattach to the servo arm.

RECEIVER INSTALLATION

Step 1.
Wrap the receiver in foam rubber and place it in front of the servos as shown in the photo. Use a small piece of foam between the servos and the receiver to hold it firmly in place. Route the antenna along the side of the fuselage and exit the fuselage through a hole just under the rocket engine tube. Use small pieces of clear plastic tape to attach the antenna to the inside of the left tail boom.





BATTERY INSTALLATION

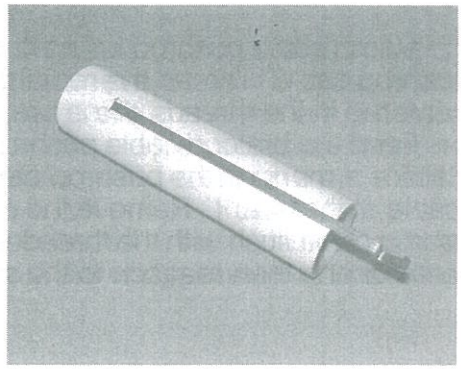
Step 1.
Refer to the photo and install battery pack just behind the servo. Make sure you wrap the battery pack in foam rubber.

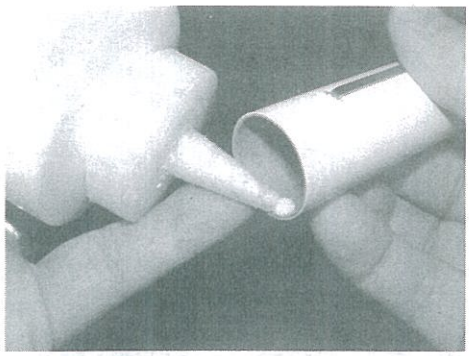
ENGINE MOUNT ASSEMBLY

Assemble the rocket engine mount according to the following instructions using white glue, carpenters glue, or CA glue.

Step 1.
Place a mark 3-1/4" (8.3 cm) from one end of the white engine mount tube. Using a sharp modeling knife make a cut in the tube that is 3/16" (5 mm) wide.

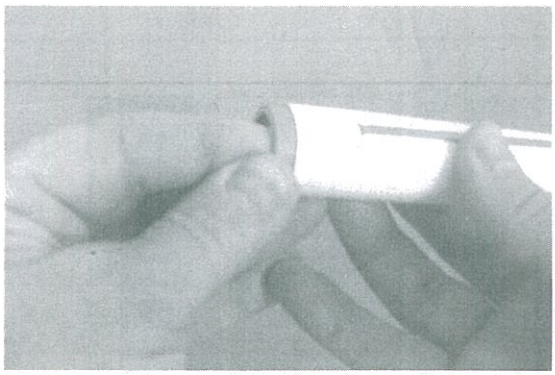
Step 2.
Insert the engine hook into the tube as shown in the photo.

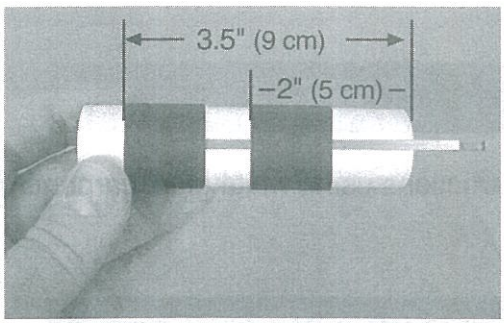




Step 3.
Apply a bead of glue to the inside of the white engine tube. Make sure you apply the glue to the end of the tube away from the engine hook.

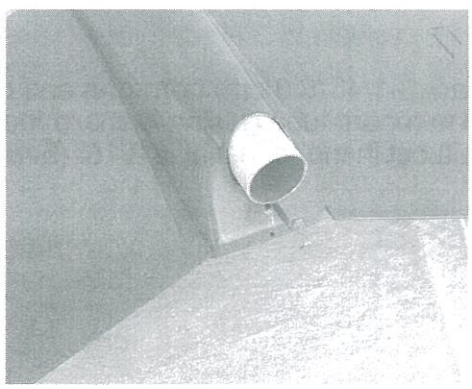
Step 4.
Push the green engine block ring into the white engine tube contacting the end of the engine hook. Allow the glue to cure.





Step 5.
Apply a ring of glue around the white engine tube and slide one of the black engine hook retainers over the white engine tube as shown in the photo. Apply another ring of glue around the engine tube and slide the other black engine hook retainer in place so that you have a completed engine mount like the photo.

Step 6.
Trial fit the assembled engine mount into the opening in the rear of the fuselage. The engine mount should slide smoothly in place. If necessary, lightly sand the inside of the opening until a smooth fit is achieved. Install the engine mount assembly by applying epoxy glue to the front of the engine mount and to the top of the fuselage. Slide the engine mount into the fuselage until it contacts the wing. Wipe off any excess epoxy glue and allow the glue to cure.



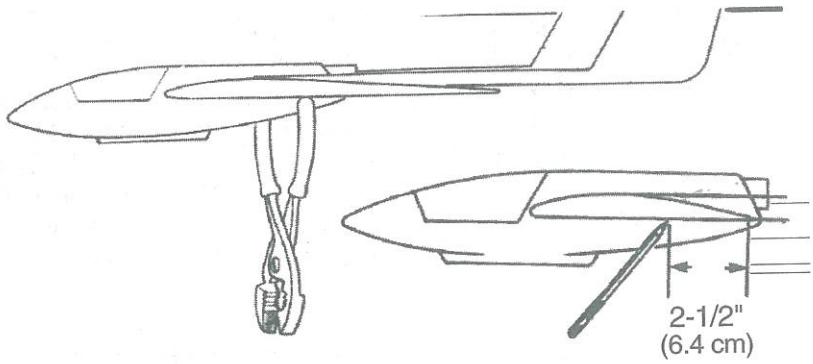
DECALS

Please refer to the package artwork for decal placement. Apply decals before balancing your model.

BALANCING

The T-25 Centurian™ must balance at the specified location shown in the drawing. This balance point (C.G.) allows the T-25 Centurian™ to transition smoothly from the rocket boost to the glide phase of the flight.

Place marks on the bottom of the wings that are located 2-1/2" (6.4 cm) forward of the trailing edge of the wing. Install a new rocket engine in the engine mount and attach the canopy. Balance your model at the marked locations by setting the model on the ends of your finger tips or atop the ends of a pair of pliers. If necessary, add weight to front or rear of the model until the proper balance is achieved.



CONTROL SURFACE MOVEMENTS

In this step you are making sure that the control surfaces move in the proper directions and each control surface has the right amount of control throw. We are assuming that you are using a standard mode 2 transmitter. If you are using a different mode of transmitter then the stick movements of the transmitter will be different from what is listed below.

- Moving control stick to the right: The right aileron travels up and the left aileron travels down = right roll.
- Moving the control stick to the left: The left aileron travels up and right aileron travels down = left roll.
- Moving the control stick forward: elevator moves down = nose down.
- Moving the control stick back: elevator moves up = nose up.
- Use the recommended control throws that are listed below. Remember that T-25 Centurian™ travels at a very high rate of speed during the boost phase of the flight.
- Elevators: 3/8" (9.5 mm) Up & Down
- Ailerons: 3/8" (9.5 mm) Up & Down

PRE LAUNCH TEST GLIDE

A test glide before your first rocket boosted flight is highly recommended. A straight-ahead throw into a light, steady head wind is best. Tall grass or sand is a wise choice for your T-25 Centurian™ first landing. The throw should be brisk with the controls set at neutral for the ailerons and elevator. Your T-25 Centurian™ should fly relatively straight with a long descending glide. It should demonstrate immediate control input response. If so, use these control settings for your first boost launch. If not, make the necessary adjustments to produce a well-controlled glide. Although a glide test is not necessary every time you fly, one should be conducted occasionally, especially after repairs have been made. To successfully carry out your first test glide, follow the preflight checklist in the preceding section.

PREFLIGHT CHECKLIST

- Verify all batteries have been properly charged.
- Verify that no one else is transmitting on your frequency. Do this before you turn your transmitter on.
- Conduct a control check.
- Walk away from your glider (about 150 feet) to conduct a radio range check.
- Make sure the airborne antenna is fully extended, the radio gear is secure, and the canopy is completely closed.
- If you have any doubts about your ability to test fly your T-25 Centurian™, we suggest that you ask for the assistance of an experienced R/C pilot before you go to the next step.

ROCKET POWERED FLIGHT

To launch the T-25 Centurian™, you will need an Estes® launch pad, launch controller with a 3/16" diameter launch rod, a D11-P or E9-P rocket engine, an igniter, and an igniter plug. Set the launch rod at about 20° degrees below vertical. Position the launcher so that the T-25 Centurian™ has its belly to the breeze. For your first flights, launch in calm or still conditions. Never launch in gusty or high wind conditions. Load the engine into the T-25 Centurian™, with the igniter installed per instructions. You can expect an altitude of 300 feet using a D11-P engine, and up to 1000 feet with an E9-P engine. The T-25 Centurian™accelerates and climbs quickly!

See the Estes® engine instruction sheet with the NAR safety code. Also see the Estes® catalog for Tech Tips and safety information before launching.

Make sure your radio is on, the spectators are safely away from the launch site, and the launch controller indicates "A Go". Give an audible countdown from T -5 seconds, press the launch button, and you're off!

Be sure to have someone remove the continuity key. Place the safety cap with streamer on the launch rod while you are flying.

Your launch should be fairly straight up with little to no control input required. As your model reaches apogee, push the nose over into level flight and you're soaring!

If your launch was other than straight up, make very small trim adjustments until straight launches are achieved.

ADDITIONAL SAFETY TIPS

- The hybrid nature of the T-25 Centurian™ demands that the pilot be familiar with both the NAR safety code for model rocketry and the AMA model aircraft safety code. Read these before attempting to fly your model.
- Verify no one else is using your frequency before switching your transmitter on.
- Make sure you inform others in the area before launch.
- Stand to one side of the T-25 Centurian™ (looking at the side of the glider, 90° to the flight path) during the first few flights until you familiarize yourself with its flight characteristics. This launch position will help you avoid disorientation during vertical boost and will allow you to make more precise corrections.
- When flying with Estes® "E" engines, be sure to recheck the balance and do a glide test before launch.
- After recovery, switch off your receiver and transmitter and check for damage after each flight.
- Avoid large control inputs during boost. Allow glider to transition to glide mode before performing aerobatics of any kind.

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