

CESSNA® 150 Aerobat ARF

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FEATURES

- Exact Scale ARF developed from factory drawings
- Light-weight Laser-cut balsa and ply construction using modern engineering assembly techniques
- Light-weight fiberglass cowl and wheel pants
- Scale landing gear including oleo strut nose wheel
- Covered with Oracover
- Working Fowler Flaps
- Wing struts with fairings
- Scale wing tips
- Scale working pilot side door with latch
- Vacuum formed tinted windows
- Includes complete quality hardware
- Online detailed assembly and set-up manual

WING SPAN 96" (244 cm) **LENGTH** 67" (170 cm) **FLYING WEIGHT** 12-15 lbs. (5.4-6.8 kg)
RECOMMENDED ENGINES .90-1.20 2-stroke glow 1.20-1.80 4-stroke glow 20-32cc gas
RADIO 5 channel (min.) and 7 servos with min. 50in. oz. torque

WARNING

This radio controlled model is NOT a toy and is NOT intended for persons under 16 years old. Keep this kit out of the reach of younger children, as it contains parts that could be dangerous. A radio controlled model is capable of causing serious bodily injury and property damage. It is the buyer's responsibility to assemble this aircraft correctly and to properly install the engine, radio and all other equipment. Test-fly your finished model only in the presence and with the assistance of another experienced RC flyer. Your model must always be operated and flown using great care and common sense, as well as in accordance with the Safety Code of the AMA or MAAC. We suggest you join the AMA or MAAC and become properly insured prior to flying this model. Also, contact your local hobby dealer to find an experienced instructor in your area. The Federal Communications Commission requires that you only use those radio frequencies specified for Model Aircraft. Do not at any time fly this model while under the influences of drugs or alcohol.

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Parts List

- 1 - fuselage
- 1 - cowl
- 2 - main gear legs
- 2 - main wheel pants
- 1 - main gear cover
- 1 - nose wheel assembly
- 2 - wings
- 1 - front windshield
- 1 - rear windshield
- 1 - large wing tube
- 1 - small wing tube
- 2 - main wheels
- 2 - side windows
- 1 - nose wheel
- 2 - top windows
- 2 - elevators
- 1 - horizontal stabilizer
- 1 - rudder
- 2 - wing struts
- 4 - wing strut cuffs
- 2 - main gear cuffs
- 1 - wing tubes



Hardware Parts

- 1 - nose wheel assembly (includes installed wheel pants)
- 1 - fuel tank assembly
- 1 - engine mount and hardware
- 1 - control horn and rods
- 1 - pull pull and clevises
- 1 - canopy screws
- 1 - cowl screws
- 1 - wing screws



Wings

Collect the following parts

- wing halves
- ailerons
- flaps
- hinges
- control horns and hardware
- servos and hardware
- 18" servo extensions for ailerons

Before you start: Go over seams with an iron or heat gun (on low heat setting) to remove all wrinkles.



Using Epoxy glue (or similar) install all hinge points into the pre-drilled holes. Make sure not to get excess glue on the hinge pins. Remove excess glue with alcohol and paper towel.

Tip: Use a toothpick and dab a bit of Vaseline on the hinge pins to help avoid glue getting on them.

Check the direction of the hinges before the glue dries.

Make sure all the hinges are aligned and are tight to the wing surfaces.

Note: The flap hinges stand up a bit from the wing as they are angled. Check that the flaps work properly and are flat with the top and bottom of the wing.

Collect the servos to be used for the ailerons as well as the 2 18" servo extensions.



Tip : use a 1-1/4 inch piece of 5/8 inch wide shrink tubing over the servo extension connection to prevent it from coming apart.



Using your servo hardware attach your servos to the pre-built servo blocks and covers located in the wings.

Note: Add a gusset of Epoxy Glue around the base of each Servo Mounting Post for extra strength.

You will need a length of fishing line or light string to bring your servo leads and extensions through both wings.

Tip: You may want to tie a nut to one end of the line or string and drop it down through the hole in the wing at the root end until it shows through the servo opening.

Temporarily install the servos and connect them making sure they are operating in the proper direction.



Note: You will notice the flap servos are mounted so they both travel in the same direction unlike the ailerons, which are mounted on opposite sides of the servo bays so they can travel in opposite directions.

Collect the ailerons and flap connecting rods and hardware.



Position the trumpet style control horns at the leading edge of each aileron with the clevis and rod installed along side the aileron servo horn.

Using a marker, mark the spot on the aileron to drill the 1/8" hole for the control horn screw. Make sure the base of the control horn does not protrude past the beveled edge of the aileron.

Drill the 1/8" dia. hole and secure the control horn.

Tip: Strengthen the hole by applying a few drops of the Thin CA in and around the hole area.

Follow the same procedure for the flaps including the gusset of Epoxy Glue on the Servo Mounting Posts.

Note: *On the flaps make the hole for the control horn is 1-1/4 inch back from the beveled edge of the flap.*



When you are satisfied with the fit and position of all controls, make a Z bend on the servo arm end of the control rod.

Tip: *Make sure the servo horn is in the centered position before making the Z bend. Your model may already have z bends made from the factory. If so, just connect the rod and adjust the clevis to suit.*

Temporarily connect your radio receiver to the aileron and flap servo and check their movements. Make any adjustments.

After you are satisfied with the travel and movements, secure the servo cover onto the wing using 4x wood screws in each. Do not over tighten the screws.

The wing should now be ready to assemble on the model. For now put them aside until needed.

Tip: *Put a drop of Thin CA glue in the holes for added strength*



Note: *Installation of optional control surface corrugations: If you opt to install the corrugations on control surfaces (ie ailerons, flaps, etc) cut away the covering, leaving an edge of 1/8" all around of the corrugated piece being installed.*

We recommend you use adhesives like "Gorilla Glue" or similar product to glue the plastic corrugated pieces in place.

Rudder

Collect the following parts

- rudder
- hardware bag
- vertical stabilizer

Check Vertical Stab for proper position and alignment and Epoxy in place.



Using hinge glue install the rudder hinge points into the rudder. Careful not too get glue into the hinge pins.

After the glue has set. Glue the rudder into the tail fin, make sure the hinges are moving in the right direction.



Note: You may notice the bottom hinge point protrudes through into the stabilizer area. You will need to trim this off using a sharp knife. This may have been pre-trimmed off at the factory.



Elevator and Stabilizer

Collect the following parts

- elevators
- stabilizer
- hinge points
- joiner



Mark a center line on the stabilizer.

Measure through the stabilizer opening in the fuselage rear and the forward positions.

You may need to notch the rear of the opening to fit the elevator joiner.



Divide this distance in half and mark the stabilizer.





Push the stabilizer through the fuse and center it using the marks. You may need to sand slightly to fit. Using a pencil, lightly mark the stabilizer along the fuse sides top and bottom. Remove it and carefully cut 1/8" inside the line using a sharp X-Acto to remove the covering. Just cut the covering, not the balsa underneath.

Again slide the stabilizer through the fuse opening and center it. Use a 90° square between the pre-assembled fin and the stabilizer to assure they are perfectly square.

After satisfied with the fit, run a bead of medium CA along all the edges of the stab and fuse.

Note: Careful not to get too much CA along the gap.

Tip: You may want to turn the fuse 45° angle to ensure the CA runs along the gap and into the cut out area.

Tip: Use a small amount of heat from a covering iron or heat gun when removing any covering.

After the CA glue has dried glue on the elevators.

Glue the hinge points into the elevator halves. Make sure they are moving in the proper direction.



Elevator Joiner

A pre-bent 1/8" dia metal elevator joiner (supplied) is used to join both elevator halves. Test fit the elevator halves. If they are not in alignment remove and bend elevator joiner.

Note: when installing the joiner, put the joiner into the rear of the stab cutout in the fuselage and then slide the stab into place. Then glue and install the elevator halves, pushing the joiner ends into place. Do this step at the same time as installing the hinges.



Glue the elevators into the stabilizer. Wipe off any excess glue. You may have to drill holes in the elevators for the joiners.



Fin Extension

You will notice on your Cessna 150 there is a factory built tail fin extension. This is made of FRP and wood to enlarge the surface area of the large scale tail fin.



Place the fin extension over the fin and center it on the fuselage top. Use a dremel tool to trim the notch on the bottom of the extension to assure a tight fit against the fin.

When satisfied using a long pencil lightly mark the top of the fuselage along the edges of the fin extension



Remove the fin extension and using an Xacto carefully cut just inside the pencil marks. Remove the covering from the fuse. Just cut the covering, not the balsa underneath.

Tip: Use a small amount of heat from a covering sealing iron or heat gun when removing any covering.

Mix up some 5 min epoxy and glue the fin extension to the fuse, wipe off any excess epoxy.



Tip: Rubbing Alcohol works great for cleaning off excess epoxy

Remember to keep the fin tight against the fuse until the epoxy dries. Masking tape works well for this.



Your plane should look like this when you are finished.

Main Landing Gear

Collect the following parts

- main landing gear legs
- landing gear cuffs
- hardware bag and wheels



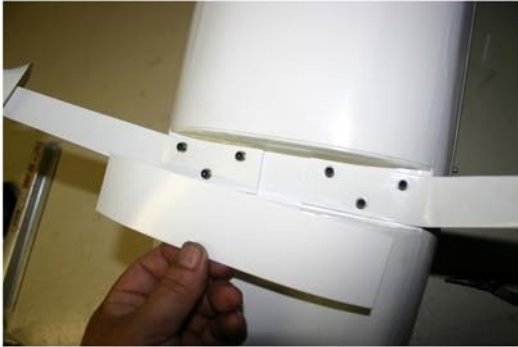
Bolt the main gear axels to the legs and slide the gear cuffs over the ends of the legs.

The long taper goes to the rear.

Using six 8-32 bolts and washers supplied, bolt the gear legs to the fuse. Make sure they are forward looking from the side. You may need to enlarge the holes.

Note: *Trial fit the cuffs to the fuse. You will need to sand them to fit the contour of the fuse.*





Place the factory FRP main gear cover over the gear. You will notice it fits into the ledges along the fuse. Trim to fit the ledges and landing gear.

Using clear packing tape secure the cover into position.

Note: *Do not glue as you may want to remove the gear at a later date.*

Use silicon sealant to secure the main gear cuffs to the landing gear legs. These parts may need to be trimmed to fit.

Tip: *Just apply the amount of sealant to the gear leg near the fuse sides. Use masking tape to hold in position until dry.*



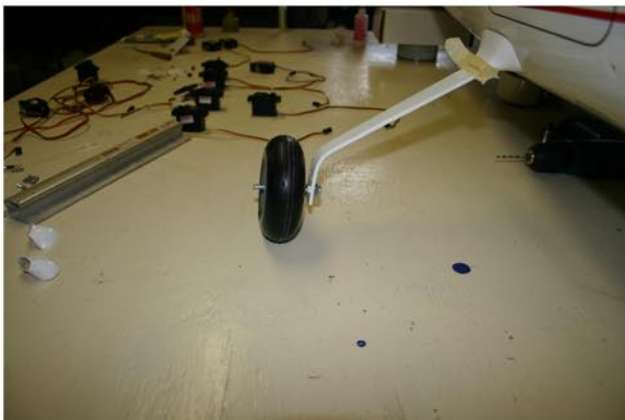
Using an Xacto, clean out around the main gear wheels to ensure a nice free fit on the axels.

Note: *Do not over tighten the Axel nut or it could pull apart.*

Tip: *You may have to remove burrs from the end of the Axel using a rotary tool so that the Lock Collars will slide over the Axel Shaft.*

Slide the locking collar onto the axel then wheel, then another locking collar. Center the wheel on the axel and tighten the lock collars. Do not over tighten. At this time you may need to adjust them when mounting the wheel pants.

Note: You may need to slightly bend your gear for proper tracking.



Main Wheel Pants

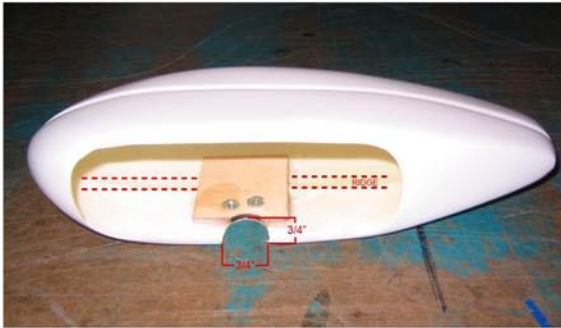
Collect the following parts

- main wheel pants
- plywood reinforcements
- hardware

Measure the factory opening in the wheel pant and mark the center.



Rough up the inside surface of the wheel pants with sand paper, making sure they are right and left pair. Wipe off the dust and clean the area.



You will notice a groove in the plywood for the ridge in the wheel pant as shown in photo.

Using medium CA, glue the plywood reinforcements and clamp into position. These may already be installed.

Make sure to make a right and left.

Using a file or dremel tool grind out the wheel pants to the dimensions shown in the above photo $\frac{3}{4}$ " wide x $\frac{3}{4}$ " high to clear the axle nut.



When the glue is set, temporarily mount the wheel pants over the axels, making sure they are level with the fuselage. Mark through the predrilled holes onto the wheel pants.

When satisfied with the fit. Remove the pants and install the T nuts. Use a small amount of CA to lock in the nuts.

When dry, install the pants onto the gear legs using two 4-40 bolts and tighten.



Make sure they are even and parallel with the fuse.

Tip: You may want to readjust the wheels and center. Make sure they do not rub the pants.

Front Nose Gear Assembly

Collect the following parts

- assembled nose gear strut and pre-installed wheel pants
- four 8-32 bolts and washers
- control rod and hardware

Use an X-Acto knife to remove covering on fuselage where nose gear is to be installed. Remove pre-installed black plastic horns from nose strut.

Using four 8-32 bolts and washers, bolt the nose gear to the pre-installed T nuts.

Install clevis over the Z bend at end of push rod. You may need to enlarge the hole in the clevis using an X-acto.

Feed the control rod through the fuse near the rudder servo and re-install one horn onto the nose gear.

Install the rod control on the rudder servo and adjust for proper direction and throw.

Tip: Use Blue Loctite on the screw and make sure the screw is tight in the steering arm of the nose gear.

Note: The nose gear rod is also attached to the rudder servo. Make sure you have it installed on the correct side.



Side and Top Windows

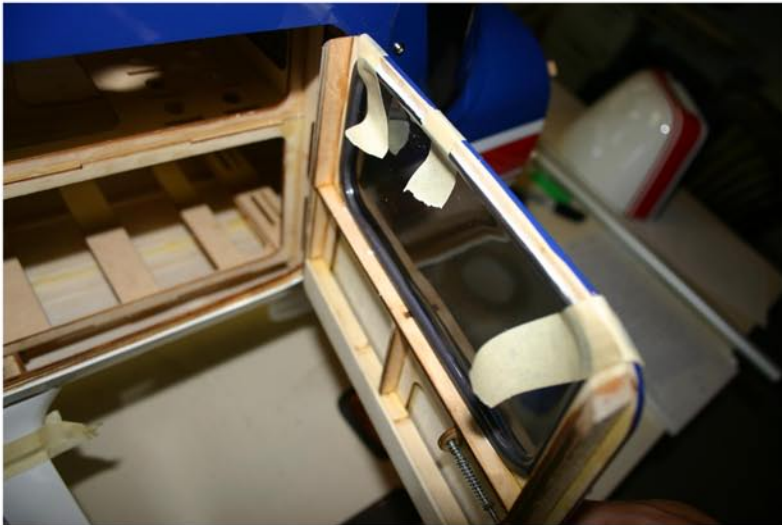
Collect the following parts

windows



Use canopy glue (RC-56 or similar) to secure the precut windows in their positions. They are glued along the inside edge. Trim to fit opening.

Tip: Use masking tape to hold them in position until the glue has dried.



Front Windshield

Collect hardware, 4 wood screws.

Locate the front windshield and center it on the fuse. Keep it tight against the fuse, mark each of the 2 holes. Drill (using a 1/16" bit) the marks and secure the windshield with 4 woodscrews.

Tip: You may also use canopy glue to help secure windshield. Tape to hold in place until the glue dries.



Note: Install the front and rear windows after you have installed your radio equipment.

Rear Windshield

Collect the following parts

- rear windshield
- 4 wood screws



Locate the rear windshield and center it on the fuselage keeping it tight against the fuse.

Mark each side for the 2 holes.

Drill the marks using a 1/16" bit.

Secure the windshield using 4 wood screws.

TIP: You may also use canopy glue to help secure the rear window.



Radio Installation

Using a sharp Xacto, cut out the covering around the wing root on the fuselage for the aileron and flap servo wires and the nylon wing bolt.

There are 2 main servo rails located on the floor front and rear. We located the rudder servo in the center, the elevator on the right and throttle on the left.

We installed our batteries and receiver on the top shelf using Velcro straps.



Rudder Controls

Collect the following parts

- rudder pull-pull hardware.



Locate the side cut outs in the fuse and remove the covering.

Tip: You may just want to make a slit in the covering for a cleaner look.

Mark the spot on the rudder across from where the pull-pull cables will exit the fuse. This would be at the leading edge, just before the bevel.

Drill a 1/8" dia. hole through the rudder on the marks and install the rudder control horns and clevises. **Do not over tighten the horns.**

Note: Strengthen the holes by applying a few drops of thin CA glue in both holes to reduce the amount of balsa compression.



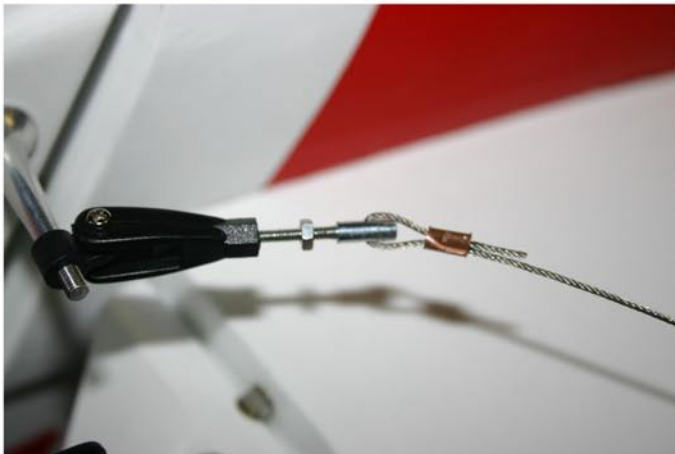
Cut the supplied pull-pull cable into 2 equal lengths. You will notice they are very long which will make it much easier to thread through the fuse later.

Note: Save the scrap pieces if you want to install optional flying wires from the stab to vertical fin on both sides.

Thread the Cable through these new uncovered holes in the rear of the Fuselage. Thread one Crimp Fitting over the end of one Cable, then thread the Cable through the outer hole in your Large Rudder Servo Arm. Fold back the Cable 1 inch and slide the Crimp Fitting over the Cable end. When satisfied with the fit, crimp the fitting. Repeat for the other end of the Servo Arm with the other Cable.



Note: Be careful to make sure the cables are equal and moderately tight. Slight adjustments can be made by adjusting the threaded cable ends in the clevises.



TIP: Use a 3/4 inch piece of 1/8 inch shrink tubing to cover the sharp end of the Cable sticking out of the crimped joint at both ends of the Cable. You will have to slide this on Cable in advance.

Elevator Controls

Collect the following parts

- elevator control horn
- clevises
- elevator push rod and end caps



Mounting the elevator control horn is very similar to the rudder but uses a push rod assembly.

Locate and trim out the covering for the side exit of the elevator push rod.

Tip: You may again just want to make slits in the covering.

Mark a spot where the push rod will contact the elevator. Drill a 1/8" dia. hole on the mark and install the elevator control horns.

Note: Strengthen the holes by applying a few drops of thin CA glue in both holes to reduce the amount of balsa compression.

Fuel Tank Installation

The supplied fuel tank is set up for a glow fuel. If you plan to use a gas engine you will need to change the stopper and fuel lines to suit gasoline.

We chose to use a gas engine so we show using Tygon (yellow) fuel line and a Dubro gas stopper.

To assemble the fuel tank stopper we used a 3 line system; Engine Carb, Vent and Fill.

Mark the firewall where the fuel lines will exit and drill a ¼" dia. hole or to fit your fuel line through the firewall on these marks.

Attach long enough fuel lines to reach the engine, Vent and refill locations.

Once you are satisfied with the assembly, install the fuel tank.



Fuel Tank Installation Options

Option 1 (picture on left) - Suspend from the top ply support plate using Velcro (not included) and Velcro straps.

Option 2 (picture on right) – Using Velcro straps (not included) attach to the right side frame.

Note: If you prefer you may install a separate tank platform (not included) to mount the tank.

Cowl Installation

The distance from the firewall to the front of the cowl should be $6\frac{1}{4}$ inches.

Start by putting a mark in the center of the pre-installed mounting blocks.

Make up some paper strips with a $1/8$ " dia. hole in one end and tape them to the fuselage with the hole directly over the mark you made on the blocks.



Position the cowl under the papers making sure the painted lines on the cowl are all even and aligned with the covering lines on the fuse.



You may want to temporarily tape the cowl in place and view it from all angles before you drill holes in the cowl

When satisfied with the alignment, drill $1/16$ " dia. holes through the cowl on the marks you made. This will prevent the wood from splitting. Secure the cowl to the fuse using five wood screws supplied.

We recommend a Dave Brown Vortech $2\frac{1}{2}$ inch Ultimate aluminum spinner painted blue or a Tru-Turn $2\frac{7}{8}$ inch Ultimate aluminum spinner (can be ordered anodized blue).

Engine Installation

Collect the following parts

- engine mounting hardware
- fuel lines



Install your engine so the distance from the wire wall to the back of your propeller is 6½ inches. We recommend positioning your engine with 3° of down thrust and 2° of right thrust. Use flat washers if needed.

We decided to use a gas engine in our Cessna. The kit comes with a complete traditional glow engine mount, hardware and fuel tank.

Slide the cowl over the fuselage ¼" to 3/8" and measure from the firewall to the front of the cowl and add 11/16" to 1/8" clearance for the propeller. This will help calculate where to position your engine on the mounting rails. You may have to make or purchase stand offs, depending on the motor you use.

The engine will have to be positioned on the firewall so that the prop shaft exits the centre of the cowl opening.

It works best to stand up the fuselage. It can be held that way in a work bench or with the landing gear hanging on a step ladder.

Then line up the cowl so the stripes line up with the fuselage. Mark the location of the cowl with tape and gently move it and mark the position of the engine on the fire wall.

Route your fuel lines and connect them to your engine.

Locate where your engine throttle control rod will exit the firewall and mark it.

Drill a large enough hole through the firewall for the throttle linkage rod.

Locate where your throttle servo will be. We located and mounted ours beside the rudder servo just inside the door on the main servo rail.





(Zenoah G20 GAS Engine shown)

Connect the throttle linkage and make sure it is working in the proper direction and operates the carburetor linkage properly.

You may want to install a linkage to operate the engine choke if your engine is so equipped.

Wing Strut Installation

You will notice your Cessna comes with 2 wing tubes and 2 wing struts. The wing struts offer both scale looks and extra strength to the wings during hard aerobatics.

Note: The struts are airfoil shaped and are right and left handed. Make sure you locate them properly.

First, insert the wing tubes through the fuselage.

Push the wings onto the tubes being very careful to keep them straight. **DO NOT FORCE THEM.**

Make sure the wings are tight against the fuse sides use two $\frac{1}{4}$ x 20 nylon wing bolts to keep the wings tight to the fuse.



Using a sharp Xacto knife, remove the covering from the Fuselage where the Wing Strut Tab will be located. Look inside the Fuselage to see where the Wing Strut Tab gets bolted and make sure you cut the hole in line with this.

Install the Wing Strut Tab into the Fuselage using the supplied bolts.

Note: Be very careful that you do not cross thread any of the bolts as this may loosen the T nuts.

Using the supplied bolt and nylock nut, secure the Wing Strut to the Wing Strut Tab and the hidden fastener on the Wing. A magnet will help locate them.

HINT: To add some strength to the end of the Struts that attach to the Wing you could epoxy wooden plugs into the opening.

To install the Cuffs at both ends of the Struts you may have to trim with a razor saw or Dremel the holes for the best fit.

Position the strut on the wing and mark cuff where the holes will be to install the strut to the wing.

Drill a ¼” dia. hole on the marks of cuff.

Tip: You may use a dremel tool. Be careful not to drill through the aluminum.



When satisfied with the fit use silicon sealant or hot glue to secure the cuffs to the ends of the strut. Make sure the cuffs do not protrude past the aluminum of the strut ends.

Tip: Do not get sealant in the hole.

Use masking tape to hold the cuffs in place until the sealant dries.

Repeat for the left strut.

Tip: You may want to position the model on its back to work on the struts.



Radio Set Up

You will need to locate your receiver and batteries on the upper plywood deck.

We used foam wrap and tywrap to secure our receiver and battery.

Tip: You will need to balance your model before securing your batteries.

Note: The C of G is on the main wing spar. 3 1/2" from the leading edge of the wing nearest the fuse.



We located our main radio switch on the right side to look like left side door latch.

If you locate the switch here, you will need to reinforce the balsa wood sides with a piece of light ply on the inside of the fuse.



Control Surface Throws

rudder +/- 11/2" - right and left
elevators +/- 11/2" - up and down
ailerons +/- 3/4" - up and down
flaps 30° - max down

Assemble the entire model and make any changes to suit.



We have taken great pride in designing a true scale model of the famous Cessna Aerobat 150. We hope you enjoy your Cessna as much as we have.



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