



SIMPLE DUSTER

The Simple Duster is a simple scale model of the Cessna Agwagon crop duster. Crop dusters can be seen anywhere in the country spraying fertilizers and other chemicals on our nation's farmlands. To watch a duster flying low over a field, then zoom up into a graceful pirouette and return for another pass is always a thrill. The skill of the duster pilots is amazing --- dodging trees and ducking under power lines or popping up over them. The turns and maneuvering makes their precision, low level passes seem simple. Whenever I am out driving and see a crop duster working a field, I pull over and watch. It is as good as any airshow.

As long as we have schoolyards to fly from, .049 powered models will be popular. This is Fred's third model in his Simple Series based on the Cox TD .049 engine and the Ace R/C's mini foam wings.

Like the other models in this series, the Simple Cub and Simple Citabria, the Simple Duster is as simple to build as can be. Construction time is only a few hours, ready to cover. The Simple Duster uses the Ace R/C tapered, mini-foam wing, landing gear, wheels, spinner, and motor mount. A complete hardware package, #37E30 is

available from Ace R/C that includes the landing gear, wheels, motor mount, spinner, fuel tank, horns, hinges, nuts and bolts, and other necessary hardware to complete the model at a very special low price, \$7.50. The tapered or constant chord mini-foam wings are sold separately. The airplane can be built from five sheets of 3/32" x 3" x 36" balsa, one piece of 3/32" plywood, and one piece of 1/16" x 36" music wire, one roll of covering and some trim. The entire airplane, less engine and radio, can be built for less than twenty-five dollars.

All of the Simple Series airplanes are spirited, two channel performers. The finished models weigh about eighteen ounces ready to fly and, with



By Fred Reese

a TD .049 or .051 engine for power, they are quick and agile. While the little Simple Scale models are not as streamlined as the 1/2A pylon racers, they are the same size and weight and use the same power. Yes, they are fast. The Simple Duster will loop and roll easily just like you would expect, but it will also fly inverted and do instant snap rolls. The full power spins are spectacular and recovery is instantaneous. It sometimes takes longer for the pilot to recover than the model. What is fun is to do low level passes over the runway just like the real thing, then zoom up into a hammerhead and come back the other way.

The Simple Duster is an unusual model, as you don't see many low winged models controlled by only rudder and elevator. The full scale Agwagon has a lot of dihedral and so does the model. This much dihedral is necessary for the model to make smooth rolling turns using only the rudder. The original Simple Duster





started with much less dihedral and it would barely turn. I cut the wing in half three times, increasing the dihedral each time until the Simple Duster would turn and roll smoothly. Ailerons could be added or used in place of the rudder control. If you do choose to use ailerons, reduce the dihedral to 1½" or less under each wing tip. To add ailerons, I would move bulkhead B rearward ¾" and

models any faster than a TD .049, but the extra power gives better vertical performance. Of course a throttle servo can be added, though you may have to widen the fuselage to make it all fit depending on the size of your servos. A four channel Simple Duster would be fun, but then it would not be as simple.

The Simple Duster could be made into a Piper Pawnee crop duster by using the Ace R/C constant chord, mini-foam wing #50K102 and using the wing tip shape and tail surface shapes from my Simple Cub plan No. 946. Pawnees are often all yellow with black trim just like the Cub. It looks to me that the Pawnee uses the same wing and tail parts as the Super Cub.

CONSTRUCTION

Cut the fuselage side template from the plan and cut out two fuselage sides from medium light 3/32" balsa. The sides can be cut from 4" wood or 3" wood can be joined. Use the fine horizontal line on the template for the top edge of a 3" piece of wood. The piece cut from the bottom rear will make the top piece. Glue on the 3/32" doublers with the grain perpendicular to the sides. Be sure to make a right and left side. I use Zap CA Plus for all of the construction except joining the foam

Material List

- 5 — 3/32" x 3" x 36" balsa sheets
- 1 — 3/32" x 6" x 12" plywood
- 1 — 1/8" dowel, approx. 18"
- 1 — 1/16" x 36" piano wire
- Glue: Zap CA Plus or equivalent, 5-minute epoxy to join foam wing halves
- Balsarite wood prep. for covering (optional)
- 1 — roll EconoKote or equivalent low temperature covering
- 1 — MonoKote trim sheet — black, 1 or 2 for color trim
- 1 — Wing, Ace R/C tapered mini-foam wing #50K101
- 1 — Ace R/C Simple series hardware pack #37E30

Note: Hardware pack is the same as for Simple Citabria and Simple Cub.

use 3/4" trailing edge stock for the ailerons and either Sig, Du-Bro or Goldberg strip aileron hardware sets. The servo can be recessed into the foam wing as much as is needed, but keep the servo as far rearward as possible so as not to weaken the foam wing too much. Use strapping tape under the wing as is shown in the Ace R/C directions.

Any of the other Cox .049 engines can be used on the Simple Duster, but they do not have the power of the TD engines. Either of the Cox .09 engines can also be used. I have used the Cox .09s on several little two channel models using the Ace R/C mini-foam wings. My original Simple Citabria was flown at first with a TD .09. The .09 or .10 engines do not fly these

wing panels. I do not cut the doubler pieces to fit; rather, I just glue on larger pieces and cut off the excess with a razor saw. It is much faster. Glue on the 3/32" x 1/4" servo rail

SIMPLE DUSTER

Designed By:

Fred Reese

TYPE AIRCRAFT

Simple Schoolyard Scale

WINGSPAN

35 Inches

WING CHORD

4¾ Inches (Avg.)

TOTAL WING AREA

166 Sq. In.

WING LOCATION

Low Wing

AIRFOIL

Semi-Symmetrical

WING PLANFORM

Tapered

DIHEDRAL EACH TIP

4 Inches

O.A. FUSELAGE LENGTH

26 Inches

RADIO COMPARTMENT SIZE

(L) 8½" x (W) 2" x (H) 2¾"

STABILIZER SPAN

13 Inches

STABILIZER CHORD (incl. elev.)

4 Inches

STABILIZER AREA

52 Sq. In.

STAB. AIRFOIL SECTION

Flat

STABILIZER LOCATION

Mid Fuselage

VERTICAL FIN HEIGHT

5¼ Inches

VERTICAL FIN WIDTH (incl. rud.)

3¾ Inches

REC. ENGINE SIZE

.049-.10

FUEL TANK SIZE

1-2 Ounce

LANDING GEAR

Conventional

REC. NO. OF CHANNELS

2 or 3

CONTROL FUNCTIONS

Rudder, Elevator (Opt. Throttle)

BASIC MATERIALS USED IN CONSTRUCTION

Fuselage Balsa, Plywood

Wing Ace R/C Foam Wing

Empennage Balsa

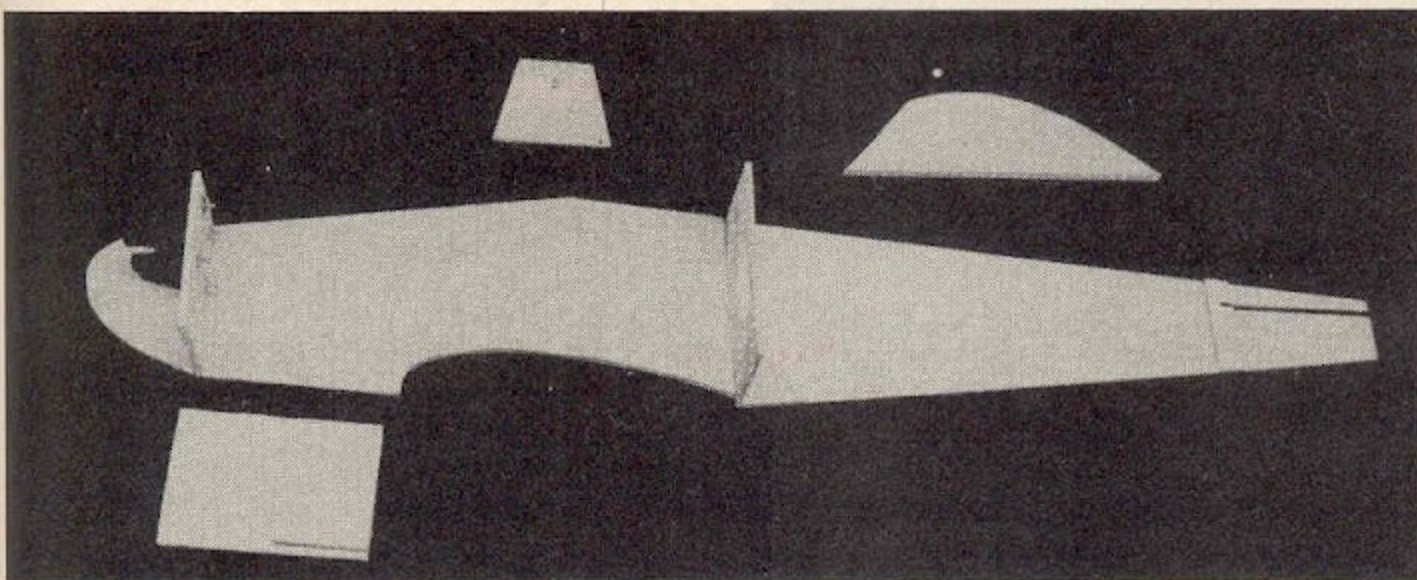
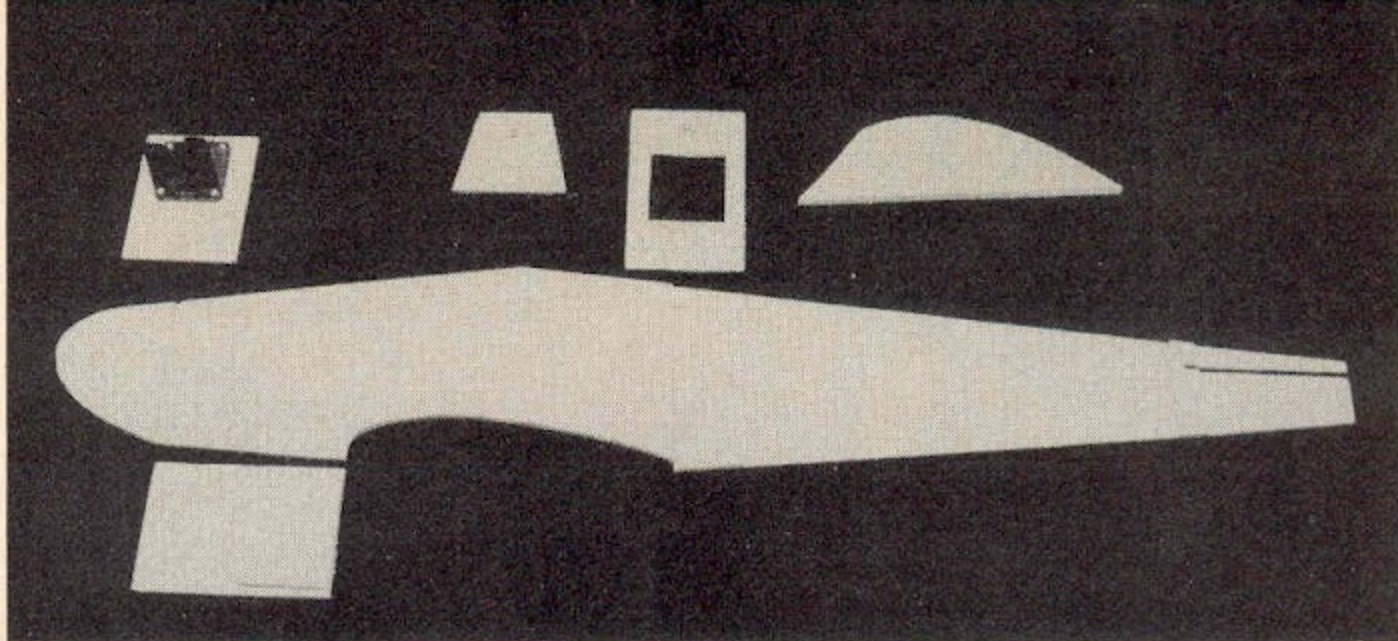
Wt. Ready To Fly 18 Oz. (1 Lb., 2 Oz.)

Wing Loading 15 Oz./Sq. Ft.



supports now. I forgot again to glue in these supports for this photo sequence and kicked myself later when I installed the servo rails. Aligning servo rails in a deep narrow fuselage is

Make the fuselage sides from 3/32" balsa with 3/32" vertical grain doublers using the template cut from the plan as a guide. Drill the firewall for the fuel lines and install the blind nuts for the motor mount. Cut bulkhead B and the canopy parts from 3/32" balsa. Cut out C and D from 3/32" plywood. Glue on the 3/32" x 1/4" servo rail supports.

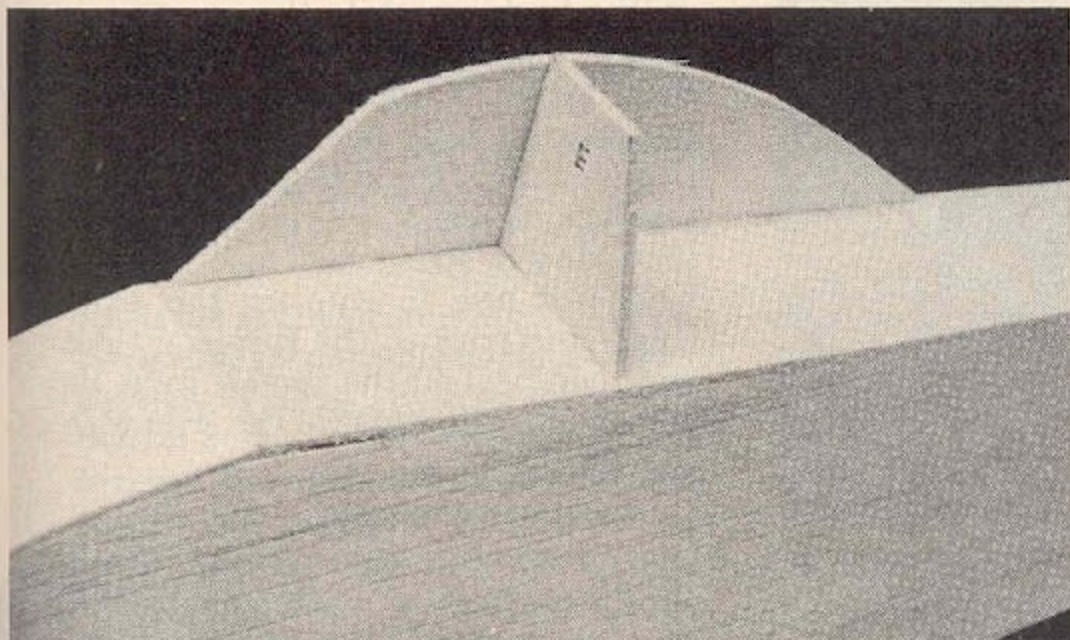
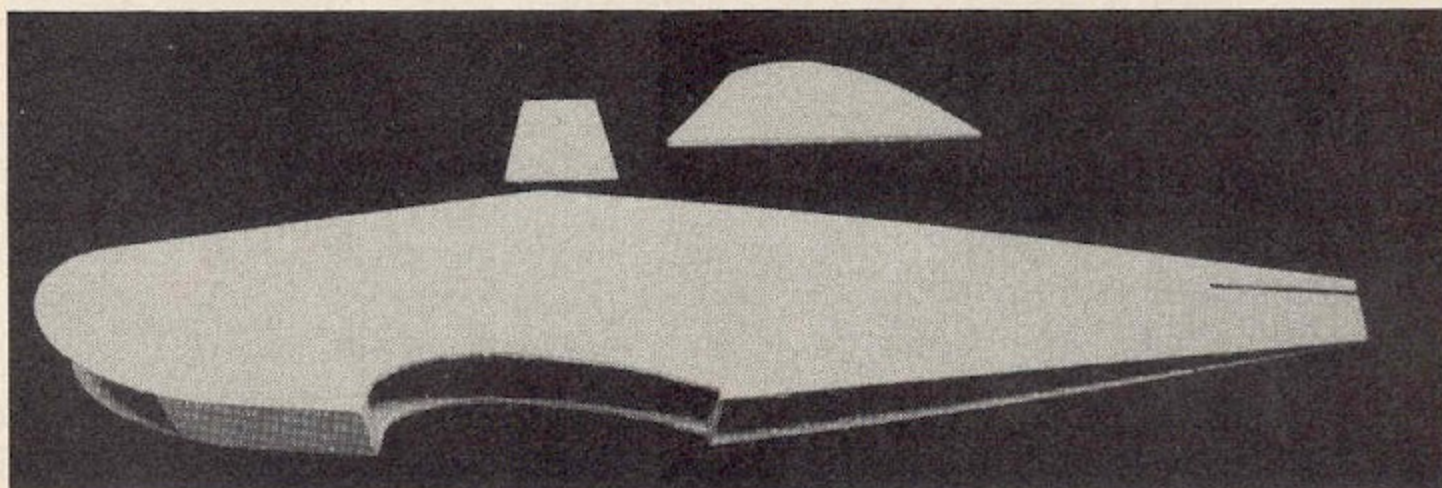


bulkhead B to one fuselage side. Glue on the other fuselage side. Glue on the 3/32" plywood bottom C, and the landing gear doubler D on the inside of the fuselage. Pull the tail together and glue. Glue on the remaining top and bottom 3/32" balsa sheeting. Glue bulkhead E onto the top of the fuselage and add the two cabin sides. You will have to bend the cabin sides a little as you glue them on. Glue on the dampened crossgrain cabin top. Sand **Glue the firewall and bulkhead B to one of the fuselage sides.**

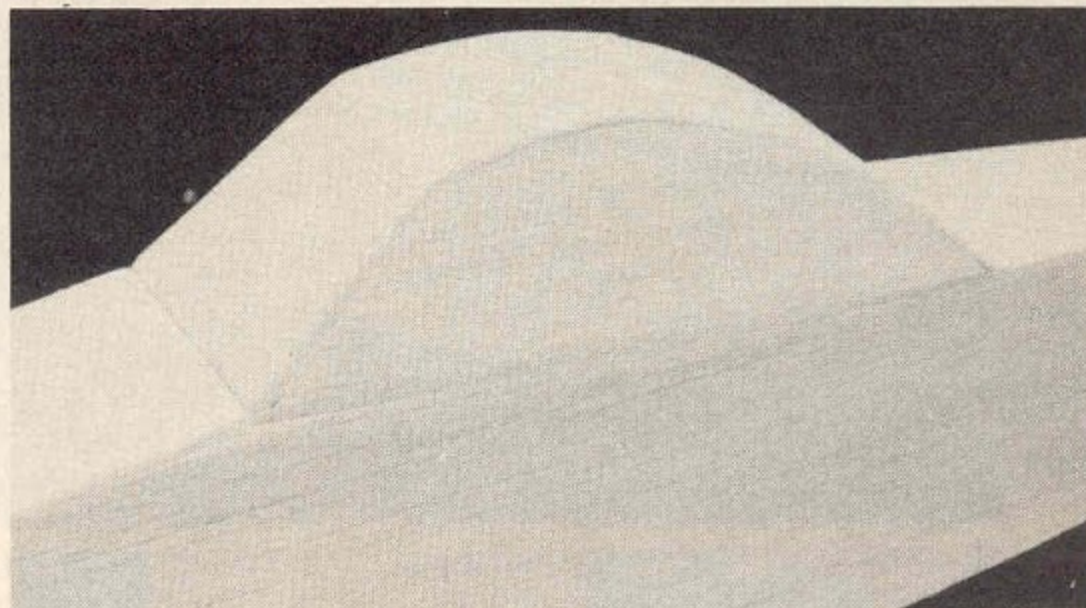
never easy unless you have a built-in guide.

Mount the Ace R/C motor mount to the firewall "A" using 2-56 bolts and blind nuts and drill two 5/32" holes for the fuel lines. Glue the firewall and

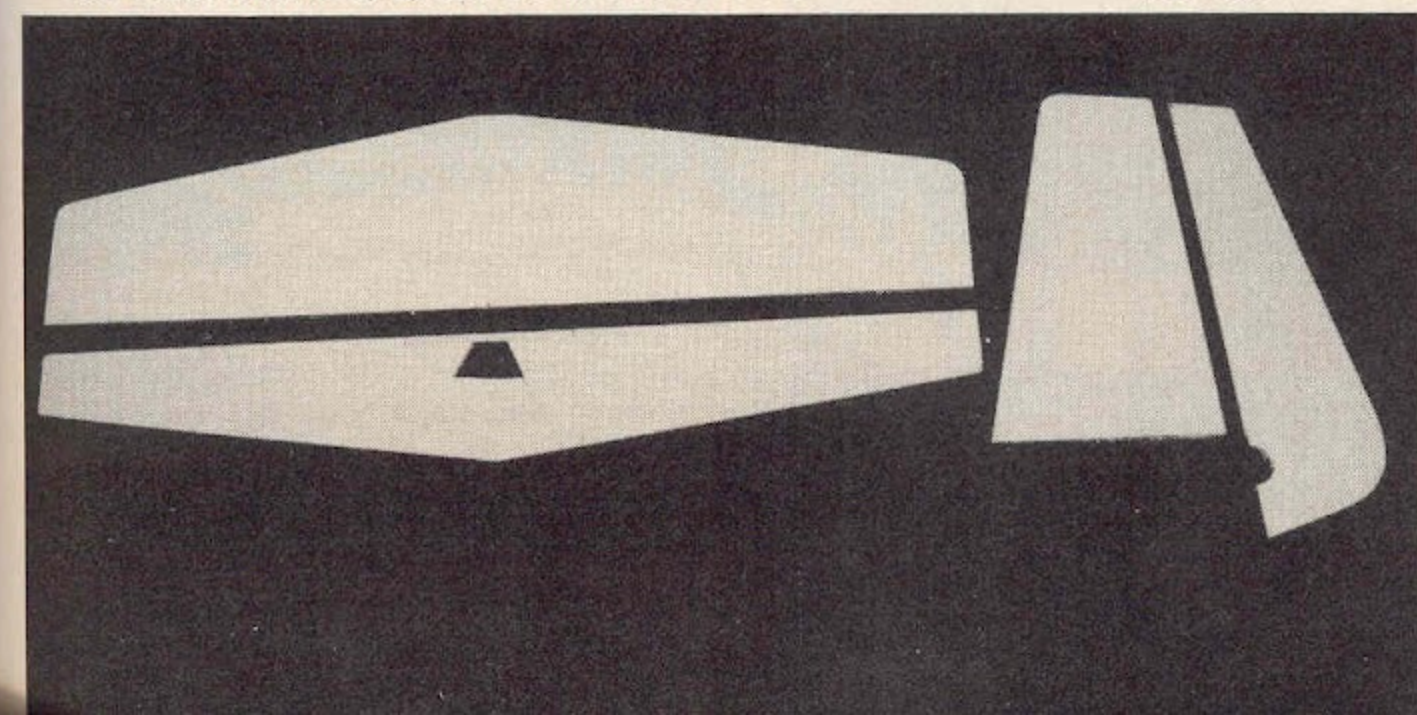
Glue on the second fuselage side. Glue on the plywood bottom, C, and the landing gear doubler, D, and install the two 4-40 landing gear blind nuts. Pull the tail together and glue.



Add the remaining top and bottom 3/32" balsa sheeting. Glue on the cabin bulkhead, E, and the two cabin sides.



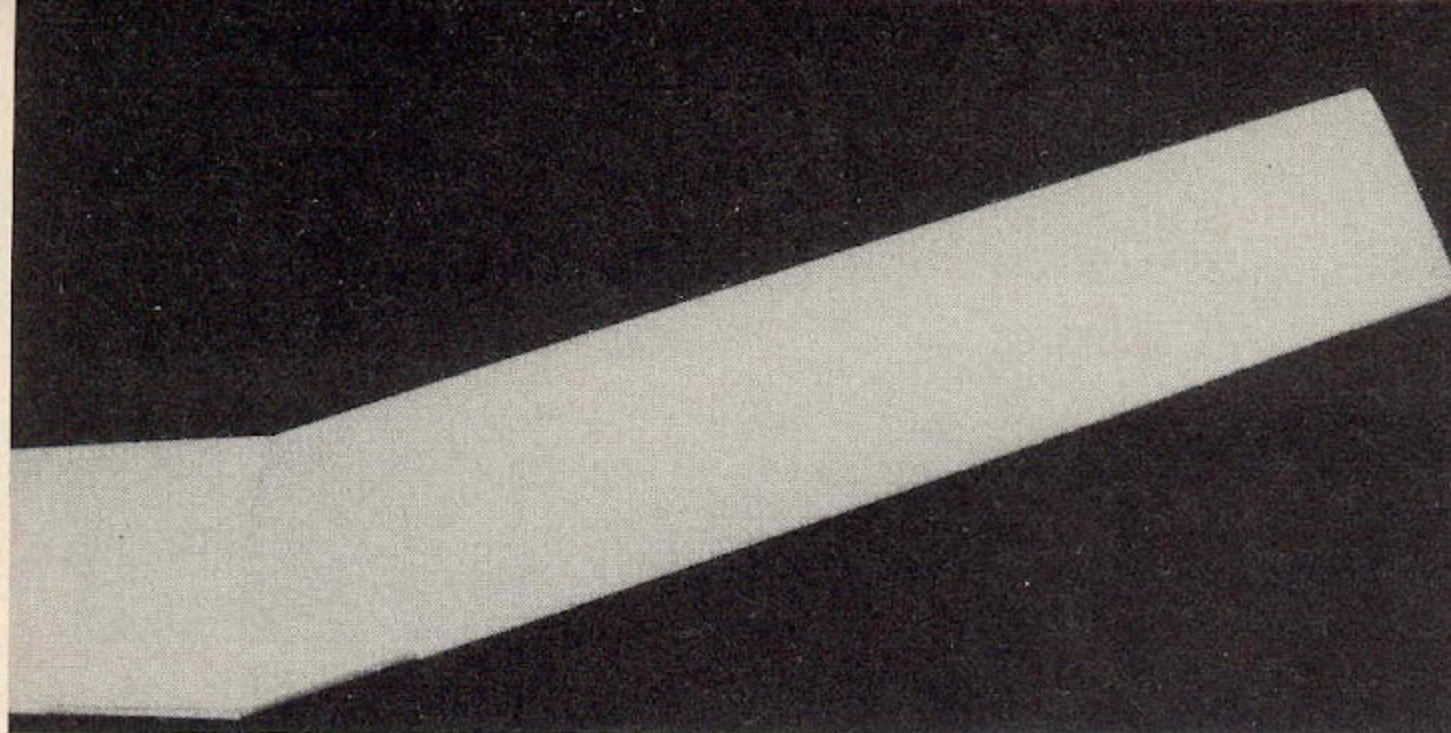
Glue on the cabin top 3/32" balsa sheeting. Glue on the flat, front piece first and trim off the excess. Add the top piece starting from the rear.



the fuselage and apply a coat of Balsarite inside and out.

Cut out the tail surfaces and join the elevators with a piece of 1/8" dowel before separating the halves. The tail surfaces can be covered and hinged

Cut out the tail parts from 3/32" balsa. Join the elevator halves with 1/8" dowel. Cover the parts with EconoKote, glue in the hinges and add any trim. Cut away the covering in the center of the stabilizer where it is to be glued into the fuselage.



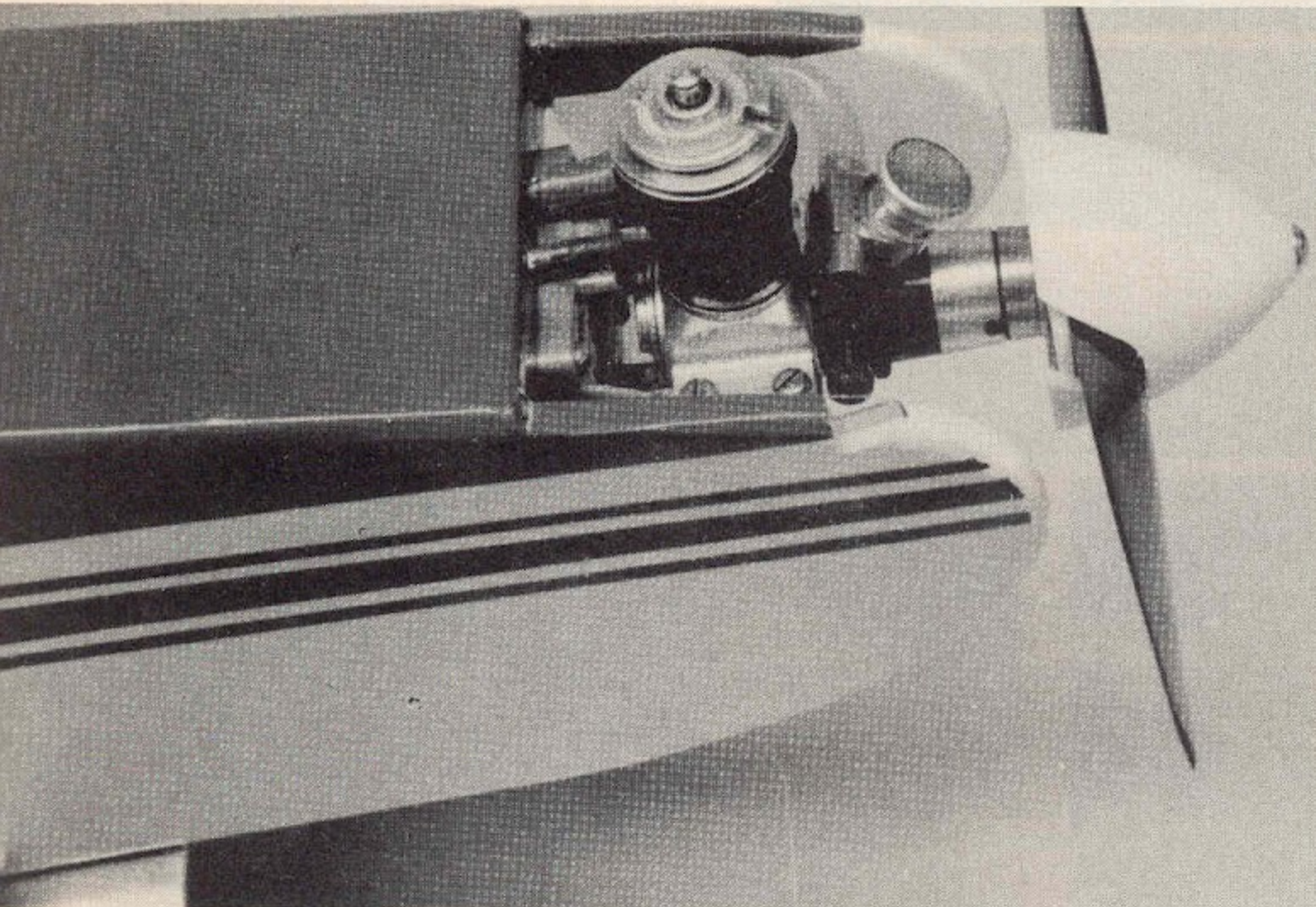
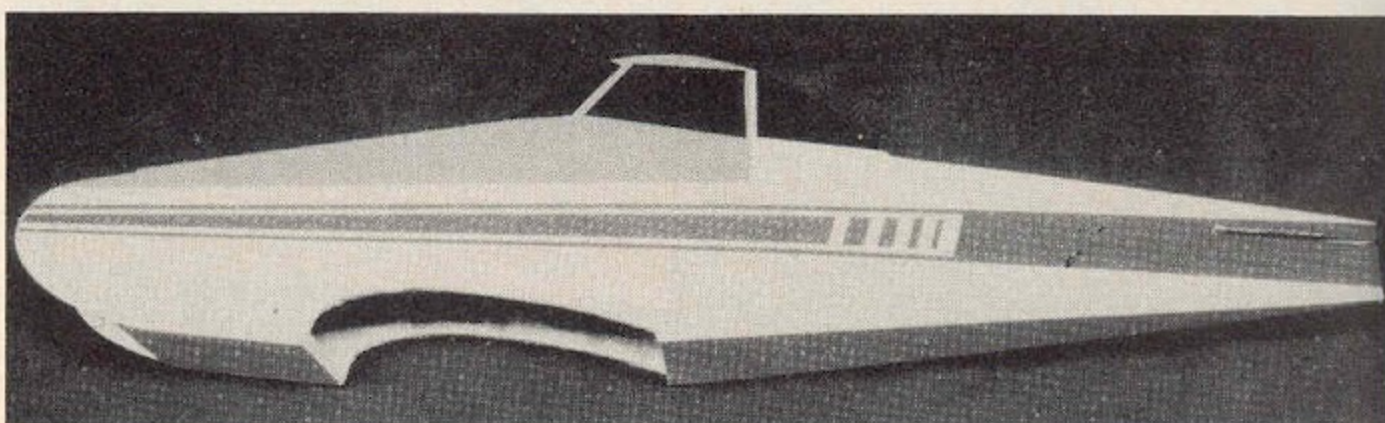
dowels to the wing. These dowels will protect the foam wing from being cut by the wing mount rubber bands. Bevel cut or sand the wing center joint for the dihedral and epoxy the wing halves together blocking up one wing tip eight inches. Lightly sand the wing with #220 grit sandpaper to remove any flashing or molding bumps. Cover

Join the Ace R/C foam wing halves with epoxy. Notch into the wing and epoxy in 2" lengths of 1/8" dowel along the trailing edge at the center to protect the foam wing from the rubber bands. Cover the wing with EconoKote or other low temperature covering.

now before gluing them to the fuselage.

Notch the trailing edge of each wing panel for a two inch length of 1/8" dowel at the wing root and epoxy the

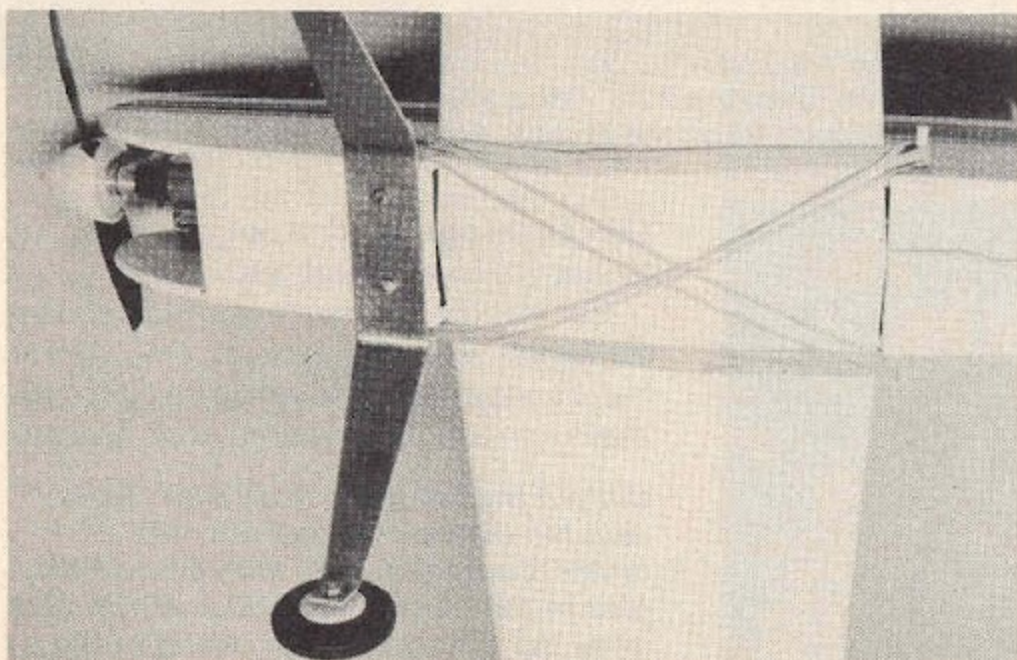
Cover the fuselage with EconoKote and decorate with MonoKote trim sheets. Install the engine and radio and landing gear before gluing on the rudder and elevator.



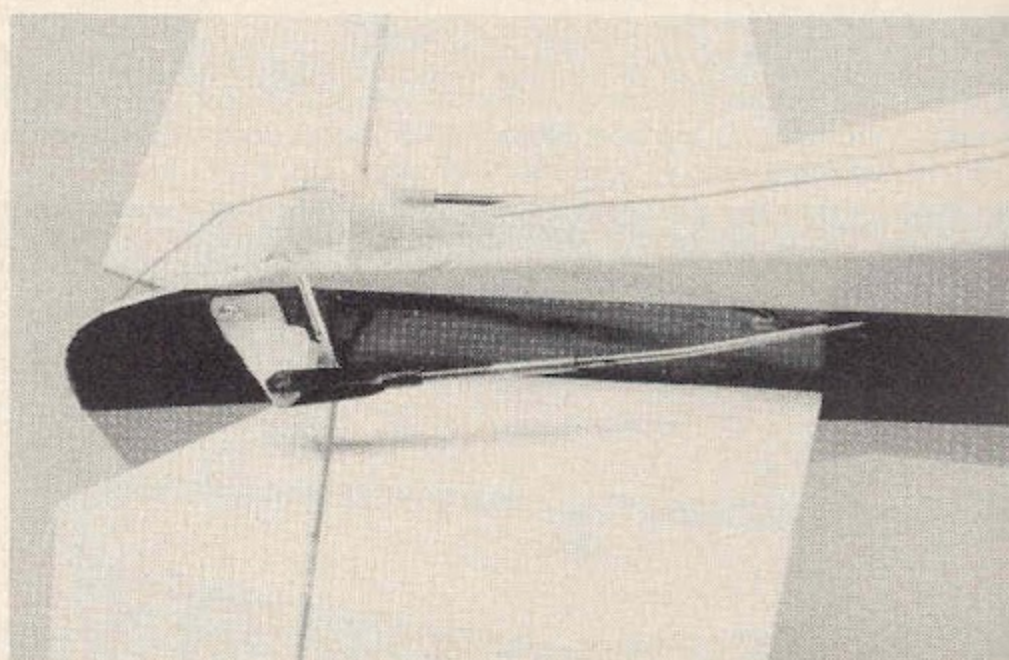
the wing with EconoKote or other low temperature covering so as not to damage the foam.

Cover the fuselage with the base color EconoKote. I used red EconoKote on the forward portion of the fuselage after trimming away some of the white covering. The red should overlap the white by only 1/8" to 1/4" or air bubbles will develop between the two layers of covering. The blue trim was cut from a blue MonoKote trim sheet. The blue pattern was left on the backing while the excess was trimmed away leaving only the final trim design. I applied Scotch brand transparent tape over the blue side trim so that it could be applied to the fuselage as one solid piece. I made a line down the fuselage with a ballpoint pen to line up the trim. Apply the trim to the fuselage sides and then peel off the Scotch Tape. Be sure to seal the edges of the trim with

Cox TD .049 on Ace R/C motor mount shown.



Landing gear installation. The wing is held on with six #62 rubber bands.



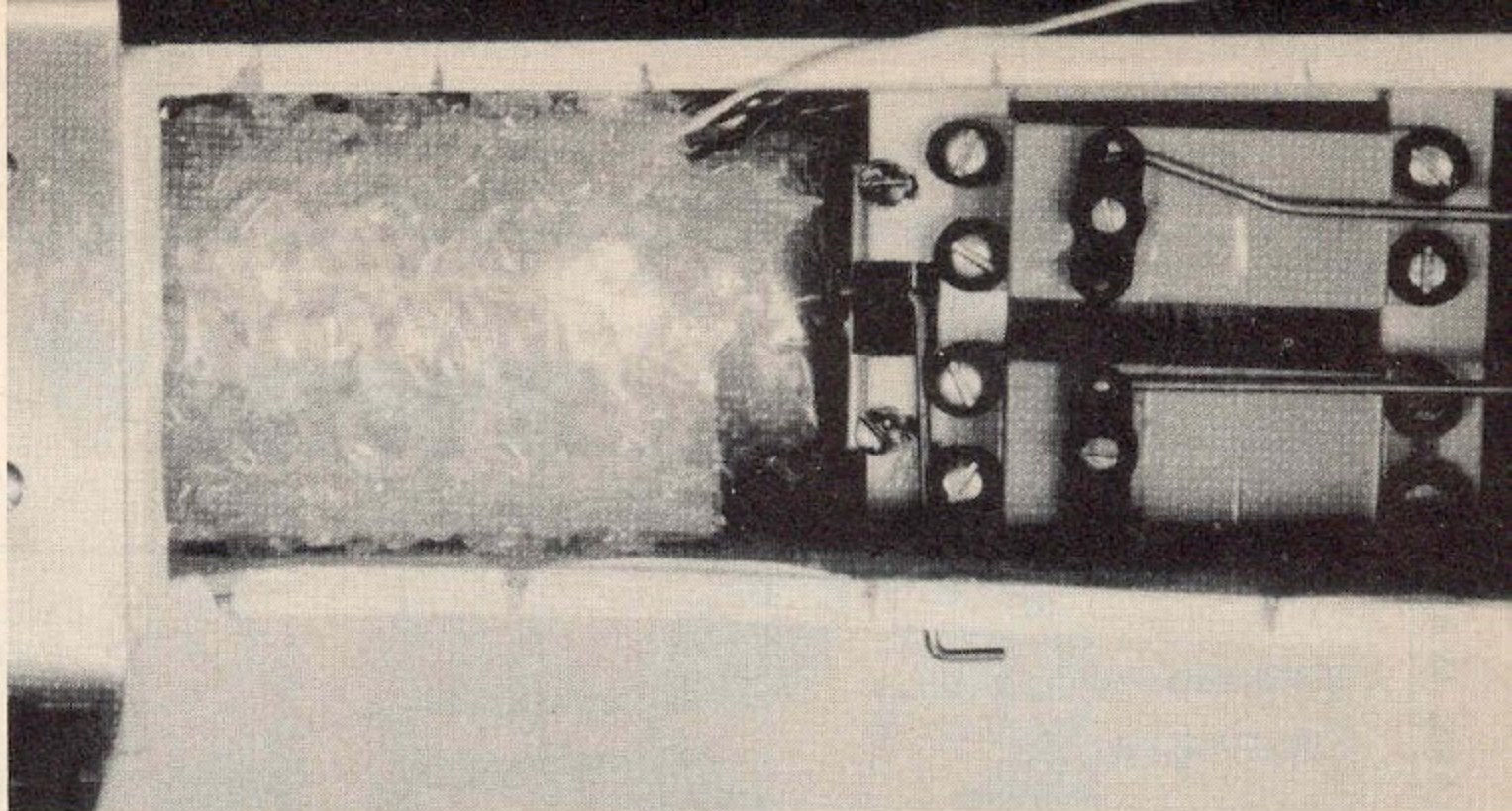
Pushrods and control horns. Loop the antenna through two holes drilled in the Goldberg wing skid used for a tail skid.

Formula U clear or urethane varnish.

Mount the servos on 3/32" plywood rails. I mount the radio switch in the forward rail and use a 1/16" push-pull wire to the switch out the fuselage side. Drill the landing gear for the two 4-40 mounting bolts and install the blind nuts in D. Bolt the landing gear to the fuselage. Install the wing mounting dowels into the fuselage and glue in the tail skid.

Cut away the covering in the center of the stabilizer that is inside the fuselage and glue in the hinged stabilizer and elevators. Cut away the covering on the top of the fuselage

**Radio
Installation.**



Ace R/C Simple Series hardware pack.
All the necessary items to complete the model for only \$7.50, a \$13.75 value.

little extra weight did not hurt the performance at all.

Flying:

The Simple Duster flies like most other fast little 1/2A models. It is a fun little flier that is cheap and expendable and can be flown in places that you would not want to risk a more expensive model. Fortunately the Simple Duster is pretty rugged and is easily repaired. The model will take off easily from the ground and just takes a little rudder correction to keep it straight until it lifts off. Keep it above the ground and out of the trees until the engine quits. When the engine quits, the nose will drop a little and the natural glide speed is fairly fast and the control response during the glide is good. Allow the natural glide speed to continue until the final approach and then flare to slow it down and land.

I prefer to use the Cox racing fuel for the Cox TD .049 engines as it gives consistent and reliable engine runs with maximum power. This is the can with the red label. I also prefer the Cox brand 6 x 3 propellers in either the hard gray plastic or the softer black plastic. The Cox propellers seem to get the most out of the .049s, especially for sport flying.

Enjoy the simple pleasures. □

under the fin and rudder and glue the rudder in place. All major joints must be wood to wood.

Make the pushrods to match the plan; both are the same. Cut the slots in the fuselage sides for the pushrod exits. Make any slight bends in the pushrods so they can move freely and project to the movable surfaces where the control horns are to go. Attach the control horns to the clevises and drill through the horn and control surface. Install the control horn screws and backplate. In this way the control horns will align perfectly with the pushrods and will not bind.

Wrap the battery pack and receiver in foam rubber or bubble pack and place them in the fuselage. The antenna can exit under the wing in the center; I drill a couple of 1/16" holes through the tail skid and loop the antenna through these holes. Install the wing with at least six #62 rubber bands.

Balance the model carefully. The tapered foam wing is a little more sensitive to C.G. than the constant chord wing. Balance with all the radio and foam padding in place and the fuel tank empty. The easiest and best way

to accurately balance these little models is to stick a pin into each wing tip one inch back from the leading edge and suspend the model by the pins. I used two gallon cans to suspend the model while I checked the balance. The model is only balanced when the tail is level. If the tail is a little low, add some weight to the nose or shift the battery or receiver further forward if possible. The model should balance as shown with a 225 mA battery pack. There is room for a larger 500 mA battery pack if you need more nose weight. I have flown with both and the

