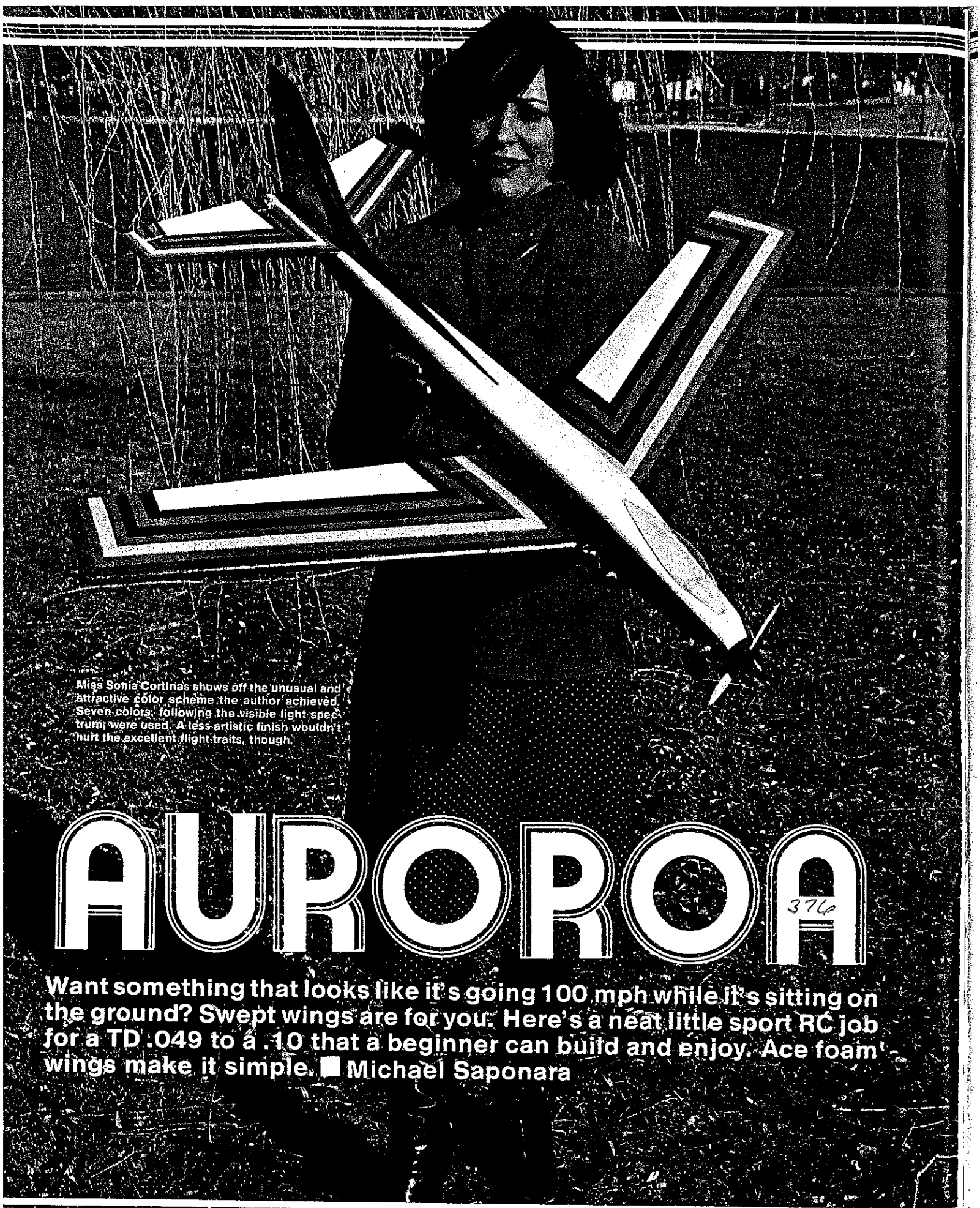


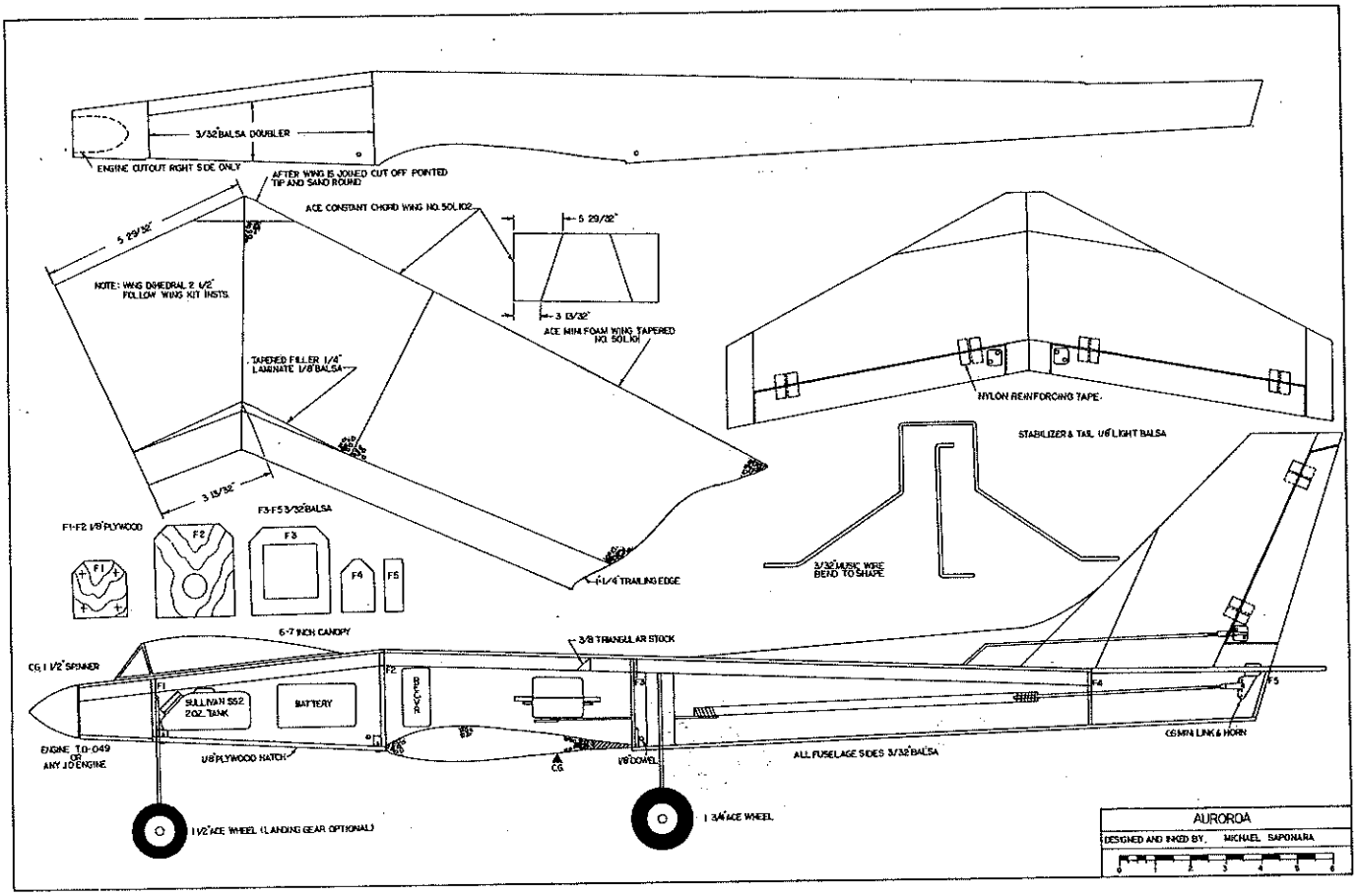
Miss Sonia Cortinas shows off the unusual and attractive color scheme the author achieved. Seven colors, following the visible light spectrum, were used. A less artistic finish wouldn't hurt the excellent flight traits, though.

AURORA

376

Want something that looks like it's going 100 mph while it's sitting on the ground? Swept wings are for you. Here's a neat little sport RC job for a TD .049 to a .10 that a beginner can build and enjoy. Ace foam wings make it simple. ■ **Michael Saponara**

FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 156



I HAVE ALWAYS been intrigued by swept-wing models. To my mind, they are the prettiest to watch. Swept-wing models are rather scarce. You can count the number of swept-wing model kits on one hand, and most of these are very sophisticated ducted-fan models. With this in mind I decided to design a sport swept-wing model that would be easy to build, easy to fly, and would be beautiful to the eye both in the air and on the ground. The Auroroa is the result of this design philosophy.

Whether you are a beginner or expert, the Auroroa is for you. It can be built for both, so if you have been thinking that you would like to build a swept-wing model but were afraid to do so, give the Auroroa a try. With a wingspan of 42 in., it has a very generous wing area of 235 sq. in.

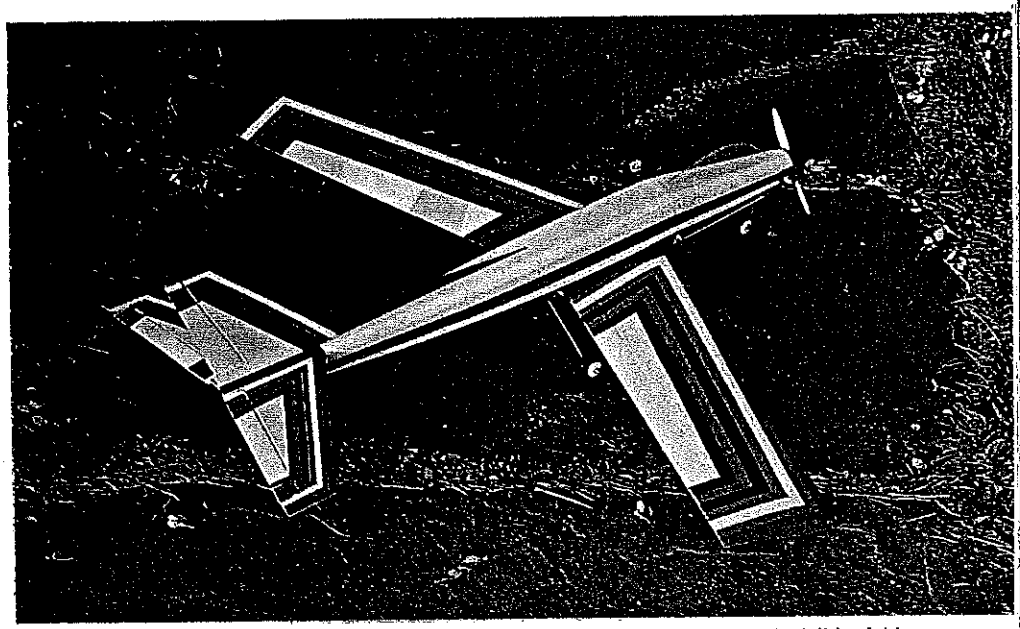
The plane uses both the Ace tapered foam wing and the Ace constant-chord foam wing (one panel required). Three center wing sections can be made from two constant-chord panels.

I chose the Ace wing for three reasons. First, it is far easier to build a model with a foam wing than with a built-up wing. Second, the Ace wing is a well proven semi-symmetrical wing with excellent flight characteristics. Third, in the event of a mishap the wing is easily and quickly repaired at the field using five-minute epoxy.

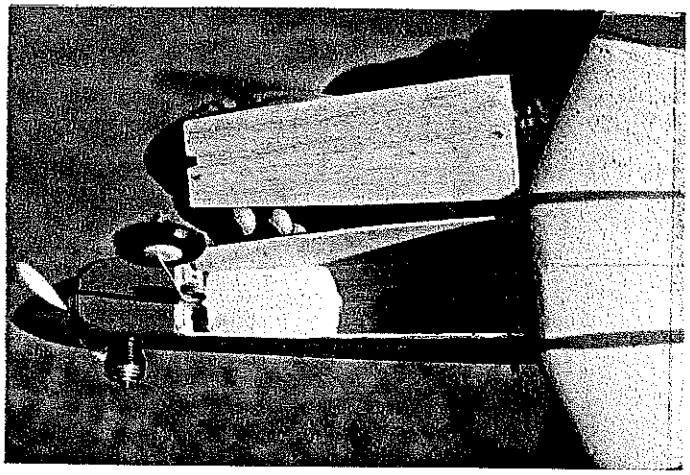
For the beginner, the model should be built with dihedral of 2½ in. under each wing tip; use rudder and elevator controls with this version. For the expert, the model should have no dihedral in the wing—and elevator and aileron controls. You may also wish to eliminate the landing gear for a slightly cleaner and faster model.

It is my belief that many people shy away from swept-wing models because they feel they are difficult to control. Nothing could be further from the truth. This model is as easy to control as the so-called trainers. Even if this is your first RC model, you will be successful if you build as described for the beginner. Don't be concerned because it is a low wing model.

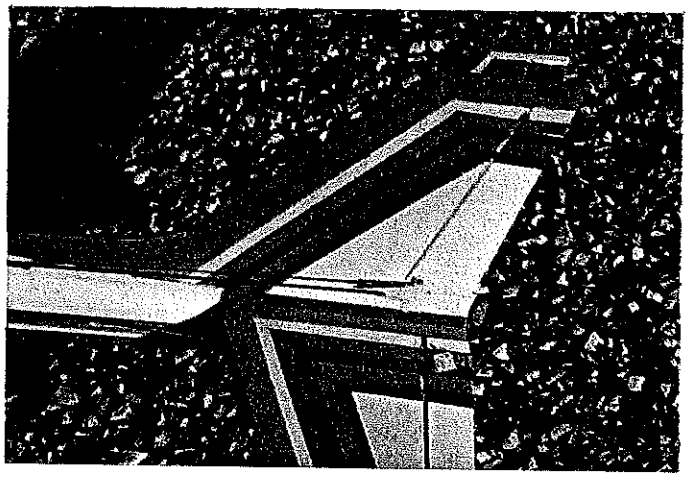
If this plane used a built-up wing and stabilizer (instead of foam and sheet balsa) the weight reduction would be enough to allow you to use a Golden Bee or Black Widow engine. The plane, as per the plans, should weigh between 22 and 26 oz., and that is too much to expect those engines to lift. I know. I tried. You will be successful if you use a TD .049 or .051, or any .09 to .10 engine. I cannot overstress this point. The TD engines develop about twice as much thrust as the reed engines even though they look similar in



The Auroroa has a jet-like look, further enhanced in the air when the prop becomes invisible. Add a pilot figure for more realism. Use wing dihedral with rudder/elevator controls for the novice version, no dihedral (or reduced amount) and elevator/aileron controls for the advanced version. There's room enough in the fuselage for full-house controls if they're wanted.



Bottom hatch removed to show that there's plenty of room for the fuel tank and battery. Wrap both with foam (removed for the picture).



A large vertical fin sets off the Auroroa. Tail feathers built from ⅛ lightweight balsa sheet. Uses Goldberg small horns, mini links.

appearance.

In its most simple version the plane uses any modern two-channel radio. However, there is room enough in the fuselage for as many as four servos. You might want to add throttle control, for example.

Construction. Let's start with the fuselage. Cut out two fuselage sides from 3/32 balsa. Glue the ⅜ triangular stock to the top of the fuselage sides. (Make sure you make one left and one right fuselage side.) Use a white glue, such as Wilhold, to glue the triangular stock. Cut out formers F1 through F5. Note that F3 has doublers for strength. The doublers are shown on the fuselage profile on the plans.

If you intend to use the landing gear (which is optional) mount the nose gear to F1 at this time. I use steel flower wire, found in any Woolworth's, to mount the nose gear. Drill 1/16 holes either side of the nose gear in three places. Wrap the wire through the holes and around the music wire. After this is done spread epoxy around the music wire in contact with former. This prevents the nose gear from shifting.

Glue formers F2 and F3 into place, making sure they are perpendicular to the fuselage side. Five-minute epoxy will speed things up. Glue the other fuselage side to F2 and F3. Glue F1 and F4 in place, then glue in F5. Glue in the main landing gear using 3/32 balsa braces as shown on the plan.

Cover the top and bottom of the fuselage with 3/32 balsa. Cut out the ⅛ plywood hatch. The fuselage is now nearly complete. All that needs to be done to finish it is to carve the fuselage corners round where the ⅜ triangular stock is located.

The wing is next. Cut off 5/16 in. from the trailing edge of the two tapered sections and the one constant-chord section, bringing the trailing edge thickness to ¼ in. This is the only modification you need to make to the tapered section. Take the constant-chord section and measure 5-29/32 in. at the leading edge and 3-13/32 in. at the trailing edge, as shown on the plans. Draw a line from these two points on both sides of the wing as shown on the plans, and cut out the two center sections. Do not discard the middle piece that is left over; it can be used for a second center section if you decide to build more than one model. Be sure to sand both wing tips before doing any measuring of the constant-chord wing section. The wing molds do not always match perfectly.

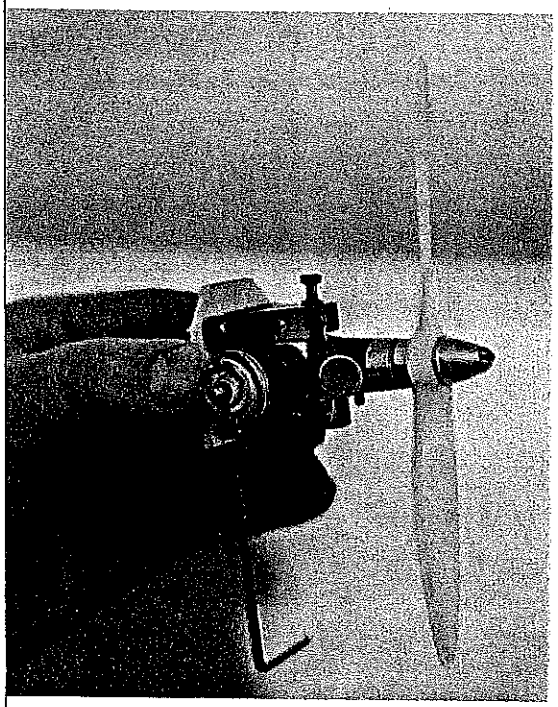
Cut out the trailing edge tapered filler section from ⅛ balsa. Four are necessary to make two that are ¼ in. thick. Epoxy these to the constant-chord wing sections as shown on the plans.

What follows next is very important. You must now glue the tapered wing sections to the constant-chord sections. To *ensure* that the trailing edges of the two sections line up, use the ¼ x 1 balsa trailing edge to line up the trailing edges of both sections. *Don't* assume the trailing edges will line up perfectly when you merely glue the two sections together. The balsa trailing edge is to be used as a straightedge against the tapered and constant chord wing trailing edges. Do this for both wing panels.

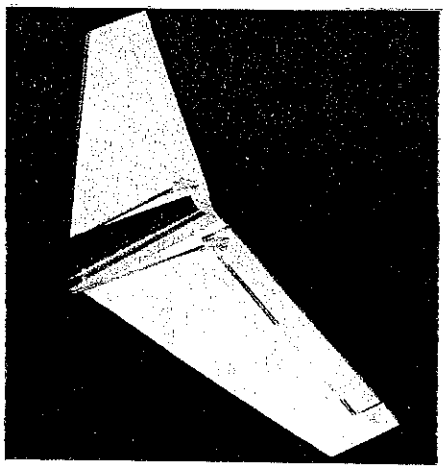
I have not found it necessary to reinforce the glue joints between the wing panels, but you may prefer to do so. Choose a method that will add as little weight as possible. Ron St. Jean's technique of covering a foam panel with silkspan, wetted down with thinned white glue, would work well here; see Ron's article in the April 1982 *Model Aviation*. If you must use fiberglass and epoxy, keep it light!

Glue the balsa trailing edge to the wing panels. Using a razor saw, cut the balsa trailing edge even with both tips. Cut the trailing edge at the angle required at the constant-chord section, producing the necessary sweep angle. If you are building the beginner's model, sand the 2½ in. dihedral angle. The method for doing this is shown in an instruction sheet included with each foam wing set. If you are building the expert version, sand the edge perpendicular to the wing surface, as no dihedral is wanted.

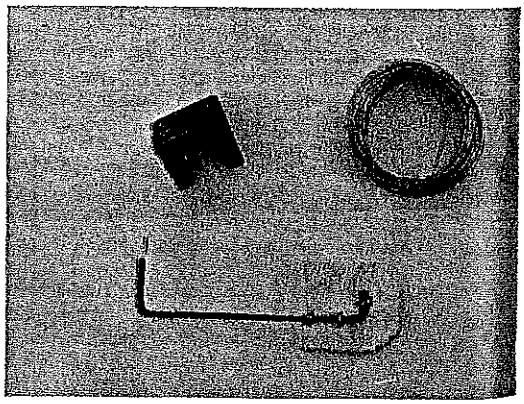
Continued on page 26



The TD .049 on the Ace engine mount, which is attached to F-1. Author says that reed-valve-type engines are too weak for this model.



Elevators required two horns and links, which are connected to a common pushrod.



Shown are the items for the front end—Ace mount, F-1 with the landing gear attached, and a roll of flower wire used to attach the LG.

Glue the two wing halves together if building the beginner's model.

If building the expert model, the first step in making the strip ailerons is to cut the balsa trailing edge ⅛ in. from the foam trailing edge along the length of the wing up to 1½ in. from the tip. A ⅛-in. strip of balsa is left on the wing trialing edge. Install strip aileron horns and linkages, and sand half-round the forward edge of the former balsa trailing edge. Cut slots for hinges, and install the trailing edge (now the aileron). This is a routine matter for the advanced builder. If you are going to cover the wing with a plastic film, you might opt for a film hinge.

You will notice that the wing tips are not parallel to the fuselage as you might expect, but are at an angle. I flew the plane with the tips angled, but you may want to cut them so they are straight. I think the model looks good with the tips at an angle, and all the photos show them this way. For better tracking you might want the tips to be straight (on the advanced version) so that you can install 1/16 plywood tip plates. Tip plates aren't needed for the beginner's version.

The rest of the model is completed by cutting out the stabilizer/elevator and fin/rudder from ⅛ light balsa. Hinge the elevator and rudder with nylon reinforcing tape.

Finishing. The method I used started with giving all balsa surfaces two coats of Aerogloss clear dope. I sanded between coats using #400 wet-or-dry. The foam wing was lightly sanded to remove the glaze with #400 paper. I chose to paint my model with one coat of Perfect white paint. I then added the colors over the white. It takes about a week to apply all the colors, since the paint takes about six hours to dry. If you want a really impressive model and are not in a rush, by all means paint the model as shown. You may, of course, use any method of covering you wish.

After you are through painting, glue the fin and stabilizer to the fuselage. Now you are ready to install the radio, tank, and engine. I highly recommend the use of the Ace ½A engine mount. The holes shown on F1 are for this mount.

I use Ace 1¾ and 1½ in. wheels on my model. If you are a beginner, I recommend that you use

Continued on page 123

The author wanted a swept-wing model, but the only kits he could find were ducted-fan types. So he created his own design using stock foam wings. Michael Saponara is shown with the appealing model which resulted.

on a calm week day and had a ball with successful flying—the Air Scout, a Gentle Lady, and the Eaglet. Meanwhile, back at the ranch, we've had some adventures of our own. But we are outta runway.

Bill Winter, 4426 Altura Ct., Fairfax, VA 22030.

Auroroa/Saponara

Continued from page 26

the landing gear.

Radio Installation. Mount the servos on ⅛ x ½ plywood rails epoxied in place. The servos are mounted next to each other but not touching. Cut pushrod exit holes in the fuselage for the elevator and rudder. Two holes opposite each other are required for the elevator; the pushrod holes are actually ⅛-in. slits 1 in. long. Mount the control horns on the rudder and elevator as shown on the plans.

Two pushrods are required—one for the rudder and one for the elevator. The elevator has two rods connected together. The pushrod wire and link are attached to the ¼ square balsa pushrod by making a ¼ in. 90-degree bend in the wire and inserting it in a hole drilled in the ¼ square. The wires are then firmly attached to the balsa pushrod by wrapping string around the wire and balsa and then epoxying the wrap. The other end of the balsa pushrod has a 1/16 wire attached to it in the same manner. Make a 90-degree bend on the end of the 1/16 wire so it can be inserted into the servo wheel.

Mount the servos in the fuselage. Connect the pushrods to them and the other end of the rods to the elevator and rudder control horns. Make sure the pushrods don't bind so that the servos always will return to the same neutral position when run back and forth. Wrap the battery and receiver with foam, and install as shown on the plans. The battery should be wrapped in a plastic bag to prevent any fuel from getting to it.

Flying. My model required 3/32 in. of up trim. Although you can R.O.G., I prefer to hand launch. Once the model is in the air it rapidly gains altitude. You can then trim for straight and level flight. If you are a beginner you will appreciate the fact that the model is easy to fly, and it is forgiving.

The model flies moderately fast on a 6 x 3 prop. With a 5½ x 3 prop Auroroa will really move. If you choose to fly with ailerons, lots of stunts are possible depending on your flying skills.

I would recommend that you do your first flights on a calm day. As you gain more experience you can fly on less favorable days, but I would not recommend that you fly on days with 12 mph or more winds. Remember, this is a small plane, and it can easily fly away if you fly in poor weather.

I hope you enjoy your Auroroa.

Radio Technique/Myers

Continued from page 29

forms of group and one-on-one competition.

On the other hand, I'm told that the OEM (Original Equipment Manufacturer) price for a synthesizer chip is about $5. With a synthesizer, you only need *one* reference crystal, and that can be soldered in. A synthesizer really solves all problems, because the device which decides which frequencies will be synthesized can be an EPROM (erasable programmable read-only memory), which is also cheap. The EPROM can be programmed to match the AMA Phase-In Plan, and when *that* changes all that will be needed is a flash from an intense UV (ultra-violet light) source to erase the memory. Then you can put in a new program with additional frequencies whenever you want them.

Dick Jannson, of the Frequency Committee, showed a $250 digital 2-meter transceiver that operates on 5 KHz spacing at 144 MHz. All that little box needed was a 5044 chip and a control stick, and you'd have a dandy RC transmitter—synthesized, digital, and with a built-in monitor for every frequency. You can bet that all of the manufacturers' representatives gave that little toy the eye. It showed what can be done *right*

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