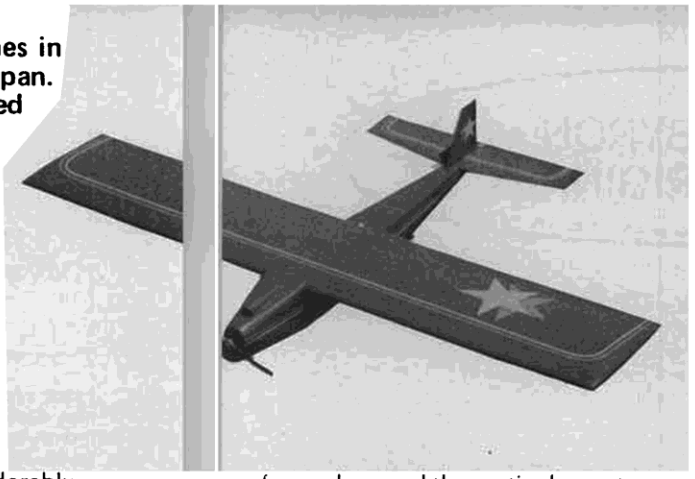
By BOB SLIFF . . . It's small, it's light, it's fast, and it comes in three versions: 29-inch span, 33-1/2-inch span, and 38-inch span. Electric power is provided by any 05 system with six or seven Ni-Cd cells. This model holds an unofficial speed record, too!



• The Fast Eddie is a fine flying electric model intended for experienced R/C pilots. It is a spectacular performer, especially when configured with the Astro 05 Challenger cobalt motor powered by seven 1.2 ah cells.

Larry Jolly piloted a Fast Eddie to an unofficial FAI, world speed record of 92.85 mph in level flight over a two-way course (measured, but not professionally surveyed) using the Astro 05 Challenger. So, it is safe to say that if you want a fast electric model, the Fast Eddie is the model for you.

The Fast Eddie can also be set up for aerobatics. If pattern flying is your thing, then the Fast Eddie with Astro 05 Challenger motor and Taipan 7-6 prop will give you an excellent rate of climb. Aerobatic maneuvers are no sweat for this combination.

Don't count the ferrous magnet motors out just yet! The Astro 05 XL and the Leisure LT-50 have very good performance. While you won't have the spectacular rate of climb or speed of the cobalt motors, the Fast Eddie will do most of the aerobatic maneuvers that an aileron and elevator ship can do.

As you can see by the plan, there are three wing size options: a 29-inch span version (217.5 sq. in. wing area); a 33.5-inch span version (261.25 sq. in. wing area); and a 37.8-inch span version (283.6 sq. in. wing area). All three versions have been flown and tested. In each case we were very satisfied with the performance. The fastest is, of course, the smallest wing version, but for pylon racing and aerobatics, the larger versions with their lighter wing loadings work best. The larger wings give smoother maneuvers, and lose less speed in tight turns.

In the following instructions, it is assumed that the modeler has precut all shaped parts such as fuselage sides, ribs, fuselage formers, etc. This prefabrication speeds assembly considerably.

To minimize confusion, keep your place in the instructions by checking off each step as you complete it, using the "( )" symbols provided.

FUSELAGE CONSTRUCTION

( ) Place the fuselage sides on the building surface with the bottoms toward each other. This is to insure you're building a right and left side.

( ) Glue the 3/16 sq. longerons and the 3/32 x 3/8 wing saddle doublers to the fuselage sides. To the extent possible, match the 3/16 sq. longerons so that they are of equal stiffness. This will allow the fuselage sides to bend evenly when the tail and the nose are pulled together.

( ) Join the two fuselage sides over the plan top view using F2 and F3. Do this by placing the sides vertically over the plan top view, bottom down, and glue F2 and F3 into place at the positions shown. Check the sides for squareness, both vertically and horizontally, and allow the glue to dry. Then, add the 1/8 sq. uprights behind F3.

( ) Pull the tail together and glue. Do not bevel the 3/16 sq. longerons, as you want an opening at the tail for the elevator pushrod, for cooling air to exit, and for the receiver antenna. Align over the plan top view and allow the glue to dry.

( ) Make the motor tube out of 1/64 plywood. To do this, the plywood is formed around the particular motor you are going to use. Begin by placing a piece of waxed paper on the motor where the plywood will overlap and glue. Then wrap the 1/64 ply around the motor allowing about a 1-inch overlap. Glue the lap joint with CA (Cyanoacrylate, such as Zap, Jet, or Hot Stuff) glue.

If you are going to use an Astro 05 Challenger Cobalt motor, then clearance notches for the brush holders must be provided for. They can be cut after the tube has been formed provided you are careful in forming the area that sticks out past the front of the motor. Furthermore, you must enlarge the hole in F2 so that the motor may pass through it for installation and removal.

( ) Enlarge the hole in F1 for the motor tube to pass through. Then, with the motor still in the tube, insert the tube into F1, and install the tube in the fuselage nose by pulling the two fuselage sides into contact with F1 and the front edge of the motor tube. Be sure to check squareness and alignment over the plan top view. Glue with CA glue and hold in position until hardened.

( ) Install the top and bottom fuselage sheeting, cross-grain.

( ) Cut the 1/4 sheet so that you have a

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Electric power VIP's (l to r) Frank Heacox (S.E.A.M. president), Bob Boucher (Astro Flight, Inc.), Larry Jolly (*Electricus, Whistler*), and *FAST EDDIE* designer, Bob Sliff (Hobby Horn).

Top view of *FAST EDDIE* shows fuselage mods for Astro Challenger 05 installation.

piece for the top front fuselage and a piece for the hatch.
( ) Glue the top front fuselage sheet in position. Then, tack glue the hatch piece into position.
( ) Sand the entire fuselage structure by rounding the corners and shaping the nose. (Use scrap balsa to fill the gaps in the fuselage nose before and while sanding to shape. Your aim is to achieve a nose shape that fairs into the spinner you plan to use.)
( ) Cut or break the hatch free, and, after the wing has been completed, sand to fit over the wing leading edge.
( ) Make an air scoop. Mark its position on the hatch, glue the scoop to the hatch, then cut away the hatch material as needed to allow for air passage.
( ) Finally, install the 1/32 ply hatch hook on the hatch, the 1/8 ply hatch hold-down hard point in the front compartment, and the 1/8 ply wing hold-down hard point at the rear of the main fuselage compartment.
( ) Set aside while the other components are completed.

WING CONSTRUCTION

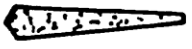
( ) After you decide which size wing you wish to make, cover the wing plan with waxed paper or plastic wrap. (Waxed paper should be used in construction is to be done with CA glues.)
( ) Mark the 1/4 x 5/16 trailing edge/hinge line (5/16 is the vertical dimension) for rib notches, and cut the notches 1/8 deep with a Zona saw. (Glue a strip of wood to the blade using CA glue to control the depth of the cut.)
( ) Place a piece of scrap 1/8 stock under the waxed paper and over the drawing where the 1/4 x 5/16 TE/hinge line is shown. (This is to shim up the hinge line piece.)
( ) Now, pin the notched 1/4 x 5/16 piece on top of the 1/8 shim with the waxed paper separating the two.
( ) True one edge of the 1/16 sheet LE material (using a straight edge and a sharp blade), and place it in position over the plan (with the trued edge over the main spar location).
( ) Then, place the lower 3/16 sq. main spar in position on the 1/16 sheet. Use "T" pins with pin clamps (Rocket City's) to hold the spar in position. Do not pin through the spar!
( ) Place the ribs in position over the spar and into the TE notches. (Note: the center ribs differ in size in their after sections, and require shimming up an extra 1/16 to compensate for the center section sheeting.)
( ) Place the upper main spar in the upper rib spar notches, but do not glue yet.
( ) Place a full-length shim (1/16 to 3/32) on top of the 1/16 LE sheet at the location of the leading edge. Then place a piece of waxed paper over this shim so that it will not be glued to the 1/4 sq. LE.
( ) Now, using a small square, straighten and align all of the ribs, and glue them into the notches of the TE by dripping CA glue into the notch.
( ) Glue in the upper spar and carefully tack glue the ribs to the lower spar. (Do not allow glue to seep down to the 1/16 sheet that is under the spar.)
( ) Place the 1/4 sq. LE on top of the shim (waxed paper between the two) against the front surface of the ribs. (Check the vertical alignment of the LE with the ribs and correct if needed.) Now glue the LE to the ribs.
( ) When all the glue has dried (or hardened), bevel the LE with a razor plane so that it conforms to the upper contour of the ribs. The leading edge sheet must glue fully to it after being bent over the ribs.
( ) Now take the second piece of 1/16 sheet and true one edge (if you have not already done so) with a straight edge and knife.
( ) Glue this sheet, trued edge to the rear, to the upper spar.
( ) When dry, start at the center, bend the sheet over the ribs and press against the LE. Pull the sheet tight, make a pin hole through the sheet into the LE, and, while holding the sheet in place, put a drop of CA glue into the hole and hold until cured. Work toward the tips until the sheet is attached fully to the LE.
( ) When complete, remove the wing panel from the plan surface, turn over, and (from the bottom) glue the top sheet securely to the ribs, spar, and LE.
( ) Trim off the excess 1/16 sheet, and with the TE shim increased to 3/16 in., lay the wing on the plan, bottom up, and pin the TE in position over the shim.
( ) Bevel the LE with a razor plane as you did with the top side.
( ) Glue the other 1/16 LE sheet (the one that you've been building over) to the spar, bend the sheet over the ribs, and bond to the LE.
( ) Remove the wing from the building surface. By using finger pressure and applying CA glue through the gap between the spars, bond the sheet to the ribs. Also, run a line of CA glue on the LE-1/16 sheet joint from the inside.
( ) If you prefer to use shear webbing, it should be installed now. We did not find it necessary on the prototypes, but if you think you might need it, pin the structure over the plan on the building surface to keep things perfectly straight. Then glue the webbing (1/32 sheet, grain must be vertical) against the back side of the spars the entire length of the wing.
( ) Now, you may remove the wing from the building surface, and with the framed-up fuselage, place the wing in position and mark and drill for the 3/16 dowel wing pin.
( ) Install the pin and epoxy into position. Before the epoxy hardens, place the wing on the fuselage with the pin inserted through the hole in F2, and hold in position until the epoxy hardens.
( ) Next, install the 1/16 sheet wing center section on top and bottom.
( ) Cut the 1/4 x 1 tapered TE stock to the sizes required for the tip TE, the center TE, and the two ailerons.
( ) Using the building surface, align the tip TE pieces, and glue into position at the tips.
( ) Glue the wing tip blocks into position and carve/sand to the airfoil shape and the desired tip shape.
( ) Take the 1/16 music wire and cut to length for two ailerons. Remember, the horns are offset in the wing . . . one will be longer than the other. Install the plastic tubing bearings on the wire, and bend the wire to shape. (Note: a slight rearward sweep of the horn will give some positive aileron differential.) The wire at the horn end should be 3/8-inch long from the bend point.
( ) Now, solder the 3/32 O.D. x 7/8-inch brass tubes to the center end of the aileron horns, then flatten the part that extends above the horn wire. Drill the flattened tube for the aileron clevis pin with a 1/16 bit (check plan).
( ) Cut the center tapered TE piece as needed to clear the horn wire and bearings. (How you cut here will depend on what type of aileron hinge you chose.)
( ) Install the horn wires and the center tapered TE piece, making sure the horns move freely.
( ) Shape the ailerons for hinging:

Monokote hinge Standard hinge

Note: for a Monokote hinge, the horn wire must be placed near the upper surface of the aileron, and will need to be able to slide in and out of the hole in the aileron. The regular hinge, with the hinge at the center, requires that the horn wire be centered — these hinges are glued in only at final assembly.
( ) Add the 1/32 plywood wing bolt support.
( ) Once again fit the wing to the wing saddle of the fuselage. When you are satisfied that it is correctly aligned (adjust the saddle as needed), drill through the wing bolt support, wing TE, and ply wing bolt hard point. Drill with a 3/16 bit. Remove the wing and open up the hole in the wing so that the 1/4-20 nylon bolt will pass through. Then, tap the ply wing bolt hard point for the 1/4-20 nylon bolt.
( ) At the location indicated on the plan, cut a hole for the aileron servo on the bottom side of the wing.
( ) Finish sand the wing and set it aside for covering and final assembly.

EMPENAGE

( ) Glue rudder parts together and sand to shape.
( ) Sand the stabilizer and elevator to shape. See fuselage side view for elevator hinge line shape for Monokote hinge. If you wish to use a standard hinge, then shape the elevator hinge line thus:



FINISHING AND FINAL ASSEMBLY

( ) Finish sand all parts in preparation for covering and/or hinging.
( ) For a Monokote hinge, I prefer to use strips of Monokote. When attaching the top strips (first), I use a 1/16 spruce or balsa spacer. Then, I bend the elevator/ailerons up sufficiently to iron on the bottom strip so that the bottom strip sticks (through the gap) to the top strip, and is then ironed down fully.

( ) For conventional hinges, for now, slot the stab/elevator and the wing/ailerons, and test fit the hinges. Do not glue the hinges into the slots at this time. The hinges are glued into place *after* the surfaces have been covered. Then, the hinges are epoxied (for pinned hinges) or CA glued (for solid type hinges) into place.

( ) Now, cover the entire model with your favorite covering material. As Fast Eddie is well stressed already, the extra rigidity of Super Monokote is not a requirement. Still, we recommend the use of Super Monokote. As an alternative, you might consider the use of Coverite's Mica Film, as it is a very light material, and can save a little weight.

( ) Next, assemble the stab and elevator to the fuselage. (Hinge them first.) Be sure that the stab is accurately aligned in all dimensions. Mark and cut away the covering where it will glue to the fuselage. Again, check alignment and glue to the fuselage.

( ) Carefully align the rudder, and mark and cut away the covering where the rudder will contact the stab. Align and square with the stab and fuselage and glue in position.

( ) Install the hatch hold-down screw.

( ) Make provisions for a landing skid if you fly over a hard surface. Over soft grass, I have not found a need for a skid, but otherwise, something like an Ace R/C Glider Skid (two strips) should work OK.

RADIO AND POWER INSTALLATION

( ) Small servos were used in all prototypes, and are probably a requirement. We have used both Ace R/C Micro servos and Futaba S-20 servos with great success.

( ) Install the 1/8 x 1/4 spruce aileron servo blocks, and mount the aileron servo. Add the aileron pushrods and clevises.

( ) Position the motor battery on the fuselage floor behind F2.

( ) Cut two 1/8 x 1/2 balsa pieces so that they fit crosswise in the fuselage on top of the motor battery pack.

( ) Cut two 3/16 sq. balsa strips to the length shown, and with the two 1/8 x 1/2 pieces below them, glue them to the fuselage sides. (The 1/8 x 1/2 pieces are rotated to allow battery pack removal.)

( ) Add the 3/16 x 1 balsa piece behind the motor battery. This prevents the pack from moving rearward. Your own pack will determine the exact position. (Note: for seven-cell packs, we have placed the seventh cell above the motor pack in the front right corner just behind F2. Some foam packing can help hold it in position when the wing is installed.)

( ) Next, check-fit the elevator servo and the receiver.

( ) The elevator servo is installed against the right fuselage side, behind the motor battery pack.

( ) The receiver is placed beside and to the rear of the elevator servo. To do this, F3 must be cut away to clear the receiver so that the receiver can pass through it. The receiver will then lay just above the fuselage floor, part way through F3. (Use seating tape and mounting tape to position and hold the receiver . . . it must remain clear of the aileron horns and the elevator pushrod.)

( ) Make the elevator pushrod from threaded rod (with mini-clevis), 3/16 sq. spruce, and 1/16 soft wire.

( ) Install the elevator horn and the elevator servo. (Use mounting tape and/or silicone glue to hold the servo to the fuselage side and bottom. With mounting tape, spread a light coat of epoxy glue on the surface where the mounting tape is to make contact.) Install the pushrod and shape as needed for the run.

( ) Fit the flight pack battery, and make provisions for it to be held in position when the wing is fastened down to the fuselage. (I used an Astro 250 mah square pack . . . Ace R/C offers a similar pack . . . and the wing held the pack in position.)

( ) Install the on-off servo/micro switch unit in a convenient place. I simply placed it in the space between the motor's rear and F3. The micro switch was attached to the side of the servo with mounting tape. A long arm activates the switch leaf. Then, the unit was simply placed, not mounted, in the area. Of course, if you have a small on-off motor controller, a second location is the area above the motor battery and beside the aileron servo. (Note: a dynamic prop brake is a good idea, for a free wheeling prop can catch on landing, possibly causing damage to the prop and model.)

( ) Mount the motor on-off toggle safety switch on the right fuselage side, near F2, or to the rear of the seventh cell in seven-cell installations. Insulate it from the cell in seven-cell arrangements with strips of seating tape.

( ) Mount the radio on-off switch on the right fuselage, just forward of the elevator servo.

FINAL PREPARATIONS

( ) With all components installed and ready, check for correct balance. I have found that a safe balance point is at the wing spar. Slightly forward of that is a safer balance point, but beware of a reward balance point, as with a rearward center of gravity, you could find that the model is unstable in pitch as well as having a tendency to snap roll at slow speeds.

( ) Check for any warps in the wing and tail. Remove any that you discover by twisting and reshrinking the covering material.

( ) Set the control throws: Set the elevator for 3/8 in. up and down to start with. Set the ailerons for 1/4 in. up and down to start for the "stock" power systems, and 3/16 up and down for the cobalt 05 version. Adjust per actual flight performance from this point.

( ) Charge your motor battery pack to peak. I like to monitor peak voltage with a digital volt meter . . . Radio Shack offers three models, and the Astro chargers have jacks for the meter leads. Leisure makes a charger with a digital readout. (Note: A new pack, or one that has not been used for a time, will not give full power for the first one or two flights . . . having something to do with "formation" of the cells . . . so don't be overly concerned if the first couple of flights are not up to par on power. Just be ready for a little less power.)

FLYING

Pleased be advised that Fast Eddie is offered for the experienced R/C pilot. It is much too quick and touchy for the novice.

All-up weight of the prototypes varied from 28 oz. to 40 oz. . . . this variation is mainly a result of the differing weights of power systems. The eight-cell Astro 05 came out at just under 30 ounces. Leisure LT-50 and Astro XL systems (six cells) were in the mid-30s, while the Astro cobalt 05 (seven cells) came in at 40 ounces.

The launch is quite important, and more so with the "stock" systems. You need a hard, straight-out heave. So, find someone who is good at this . . . a poor launch can crash you real quick.

After launch, go for altitude, *but stay off excessive up elevator until good speed is gained and maintained.* Once up, then adjust the trims and begin to fully check out the controls.

When landing, I have found that Fast Eddie can be slowed up rather appreciably. Still, it is best to keep the speed up until you are sure just how much you can safely slow it up. Also, be advised that Fast Eddie, being rather clean, will float quite a bit before touchdown. So, be careful of over-shooting on landing. Still, try to keep your landing as gentle as possible. •