



ELECTRAGLIDE 62

Combining the best of two worlds, Jim Zarembski's Electraglide 62 is an electric powered sailplane designed for maximum soaring performance. Its quiet Astro 05 will take it almost out of sight, while its nine to twelve ounce wing loading will enable it to find even the most elusive thermals for quiet, effortless sport soaring on those lazy, warm summer days.

Editor's preface: The designer of the Electraglide 62 electric powered sailplane is a member of the Toledo Weak Signals Club as well as editor of their club newsletter. Twenty-four year old Jim Zarembski is employed as a Staff Industrial Engineer for one of the nations largest die casters. His R/C interests have revolved around sailplanes for six years while he has given electric powered models priority since early 1973. Some of the photographs accompanying

this article are of RCM's prototype of the Electraglide 62 which I built from Jim's original plans. This aircraft has to be one of the most enjoyable sport machines that we have flown. On a clear day the Astro 05 engine would take the Electraglide 62 almost out of sight, while in the power-off condition it flew very much like a conventional Standard Class sailplane. In fact, during summer conditions, 30-60 minute thermal flights

were not at all unusual after the aircraft had reached maximum altitude during the power run. You will find this machine easy to build, rugged, quiet and powerful, and combining the best of two worlds – soaring and powered sport aircraft. So, if either of these two facets of our hobby appeal to you, you can eliminate the hi-start or electric winch from one, and the messy, noisy fuel gulping engines from the other in this outstanding model by Jim Zarembski - -Don Dewey.



I have been fascinated by the concept of electric powered radio controlled aircraft since I first read of Bob and Roland Boucher's RF-4 in 1972. At the 1974 Toledo Conference, Astro Flight introduced the Astro 05, or "Astro Pup," as it is affectionately called. Roland demonstrated a small, highly maneuverable cabin model powered by the "Pup" and, to say the least, the crowd was impressed. Few onlookers had ever seen a modeler place his plane on an ice runway, walk 30 feet away, turn on the motor and take off. Once in the air, all that could be heard was the whine of the prop and the wind over the wings. The "Pup" was a strange but pleasant surprise.

Subsequently, visions of a small powered sailplane popped into my head. The Astro 05 would be an excellent motor for such a model. The unit weight is 13 ounces and, at a retail price of \$35.00, it is the least expensive R/C electric propulsion system now on the market. It turns a Cox 6/3 prop at over 15,000 rpm with good duration and can be recharged from your car cigarette lighter in 15 minutes. I arranged to receive a pair of "Pups" which arrived in early spring of last year.

After spending most of the Summer getting acquainted with electric flight, the design of an Astro 05 powered sailplane was given first priority. The first step in the design process was to select the NACA 4412 airfoil. It was felt that a thick section would give good results with an anticipated high wing loading. After choosing the airfoil, I went to the drawing board with several specific ideas. The model would be a cabin type glider with the cooling air inlet required to keep the motor battery from overheating located directly under the leading edge of the wing. The fuselage would have to be strong, light, and quite simple to build. In order to prevent a "banana" effect, the fuselage formers would be keyed to insure that everything would be in its proper place when the glue sets up. The first two fuselage formers would also locate the mounting tube in which the "Pup" would be friction fit.

The wings would have to be constant chord to allow the ribs to be stack cut on my trusty jig saw and the stab and rudder assemblies would be straight-forward and very similar to those found on many of the sailplanes now flying. The result of many hours on the drawing board and on the workbench brings you the Electraglide 62.

Upon completion of the first Electraglide 62 last fall I came home from work and charged the motor system to test the R/C gear with the Astro 05 running. There were no problems so I decided to go to the neighborhood schoolyard to make a few test glides. It was getting dark so the motor run would have to wait until Saturday. After frantically assembling the model, I flipped on the R/C unit and ran into the light Fall breeze with the bird above my head. With a

firm toss the Electraglide was released. Prepared for a disaster, I was quite surprised when the first test glide was flat, smooth, and similar to that of any good sailplane. After a few more test glides, I lost my senses and turned on the "Pup". Up she went in a gradual left bank. After circling the field once and gaining about 75', the motor was turned off and Electraglide made a perfect landing! It was now nearly dark but I

for the system, so I flew it for several months with a standard 500ma pack. The flying weight of this model was 36 ounces.

A typical flight consists of a hand launch and 3-4 minutes of circling climb (Fellow Weak Signal Club member, Rick Lederman, calls it an electric thermal), to an altitude of 500'. Near the apex of the climb, the motor rpm noticeably diminishes and the "Pup" can be turned off. Now the thermalling begins! If no lift is found, the flight duration will average 6-8 minutes. (I have had trouble finding lift in the harsh Ohio winter! It's probably there, but I'm not going out in 14 inches of snow to find it.) The longest duration with my Electraglides has been a 13 minute flight, but I understand that the RCM prototype has surpassed 30 minutes. Needless to say when the thermals of next Spring start popping, I'll be there ready to catch them.

This might be a good place to tell you that if the battery pack of any electric propulsion system is cold, it will not take a good charge. Hence, the first motor run of a day is always shorter than subsequent flights. This is nothing to worry about and this condition should be expected.

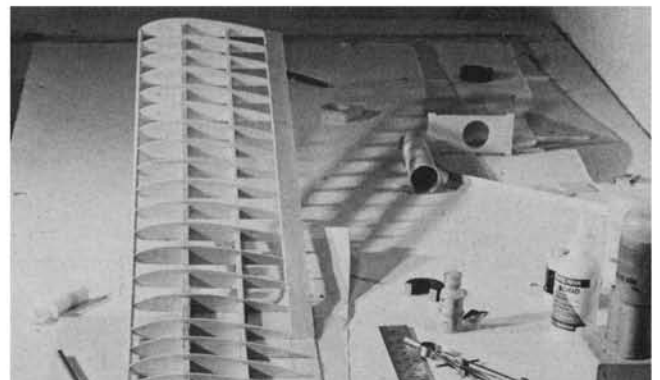
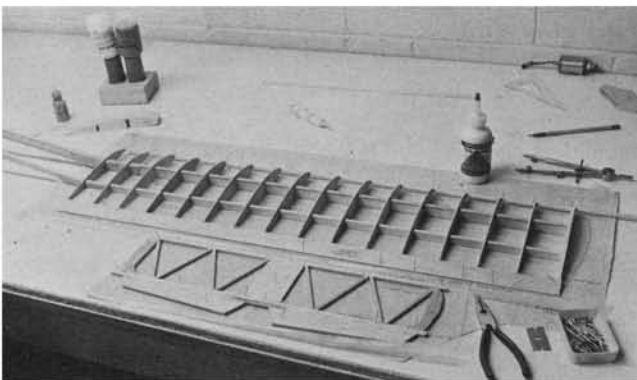
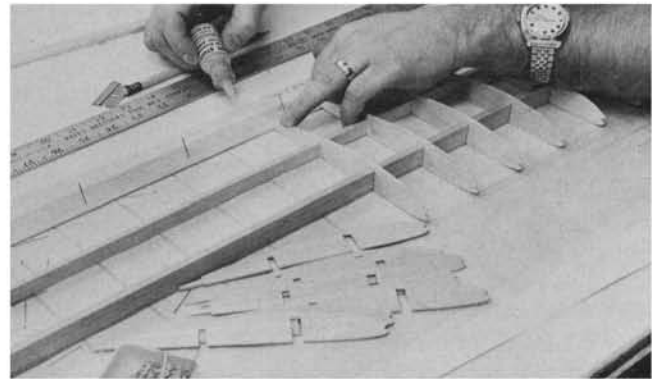
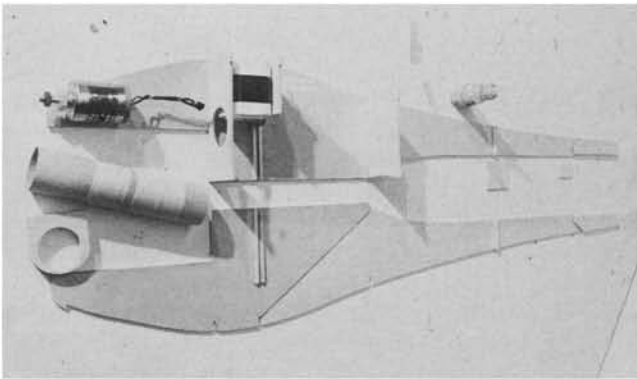
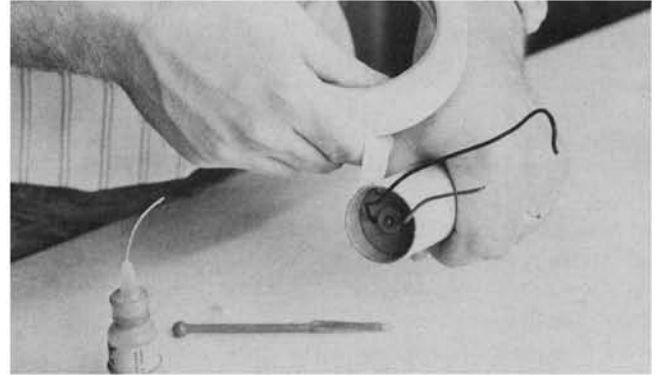
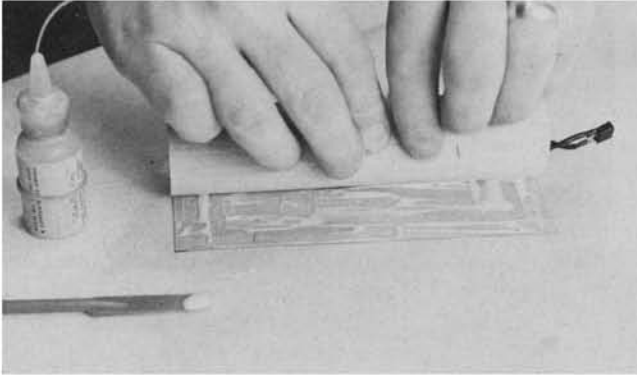
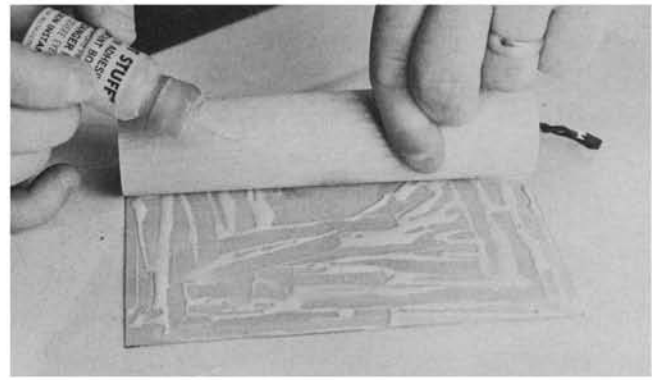
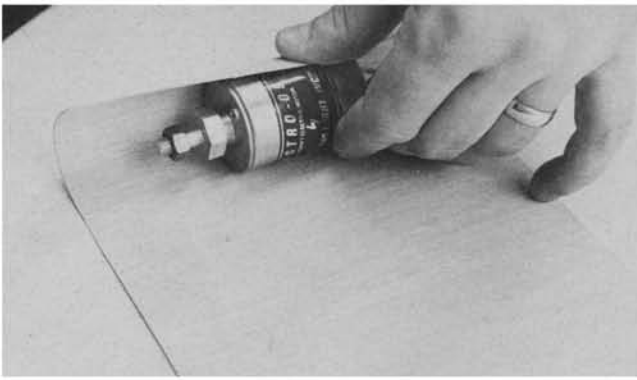
The drawing of the Electraglide 62, shown here, has a slightly shorter tail moment since the original was excessively long. If you decide to build an Electraglide, a total flying weight of 30 ounces should be your goal, although it will fly up to 40 ounces. The careful selection of wood, and the prudent use of adhesives will give the patient modeler a strong but light airframe. In addition, a 225ma battery instead of the heavier 500ma pack will save 2 ounces. The photograph of the R/C installation shows an effective way to eliminate the third servo to turn the "Pup" on or off. Finally, the wheel assembly can be replaced by a skid for a further weight savings. At 30 ounces, the motor run will take this model higher where there is more potential for finding lift. Without further ado, let's begin construction with the fuselage.

Of course, the first thing you should do is familiarize yourself with the drawing and construction photographs. Find two 3/32" x 4" x 36" balsa sheets and splice them into one sheet 8" wide. From this sheet, cut out two identical fuselage sides. Pin one side over the other and drill the holes for the wing hold-down dowels so they will line up perfectly when they are inserted later. Cut out the 1/32" plywood fuselage formers and fasten them to each fuselage side. Make sure you make a pair and not two left sides! I have found that 5 minute epoxy works well for this purpose. Next, wrap a piece of 1/64" plywood, 6 1/2" long and 9/4" wide, around the Astro Pup as shown in the photographs. Use aliphatic resin brushed on over the area that will wrap around itself. When forming the tube, Hot Stuff or any other cyanoacrylate can be used to hold the tube together while the resin dries. I usually

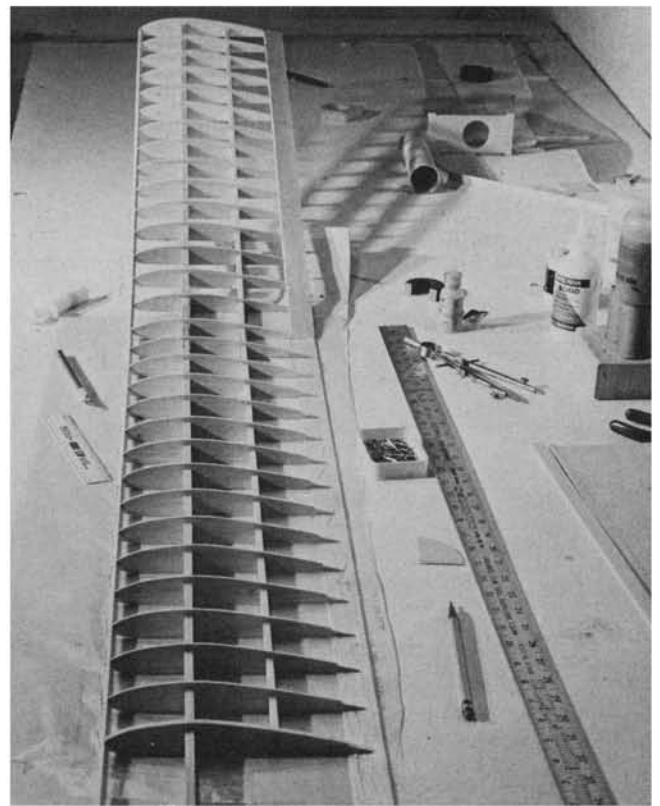
ELECTRAGLIDE 62	
Designed By: James V. Zarembki	
TYPE AIRCRAFT	
Elec. Powered Sailplane	
WINGSPAN	
62.5 Inches	
WING CHORD	
7-11/16 Inches	
TOTAL WING AREA	
480 Square Inches	
WING LOCATION	
High Wing	
AIRFOIL	
NACA 4412	
WING PLANFORM	
Constant Chord	
DIHEDRAL, EACH TIP	
3 Inches	
O.A. FUSELAGE LENGTH	
34 Inches (incl. rudder)	
RADIO COMPARTMENT AREA	
(L) 5 3/8" X (W) 2" X (H) 4"	
STABILIZER SPAN	
17 1/4 Inches	
STABILIZER CHORD (incl. elev.)	
4 3/4 Inches (Average)	
STABILIZER AREA	
79 Square Inches	
STAB AIRFOIL SECTION	
Flat	
STABILIZER LOCATION	
Top of Fuselage	
VERTICAL FIN HEIGHT	
5 1/2 Inches	
VERTICAL FIN WIDTH (incl. rudder)	
4 1/2 Inches (Average)	
REC. ENGINE SIZE	
Astro 05 Electric	
PROP SIZE	
W/Cox 6/3 Gray Prop	
LANDING GEAR	
Single Wheel or Skid	
REC. NO. OF CHANNELS	
Three	
CONTROL FUNCTIONS	
Rudder, Elevator & Motor On-Off	
BASIC MATERIALS USED IN CONSTRUCTION	
Fuselage	Balsa, and Ply
Wing	Balsa, Ply & Spruce
Empennage	Balsa
Weight Ready-To-Fly	30-40 Oz
Wing Loading	9-12 Oz./Sq.

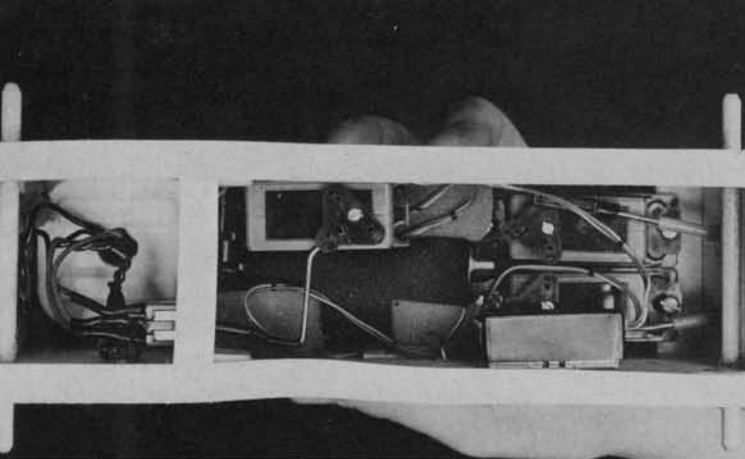
couldn't resist the temptation, and three other short hops were made on that evening. The excitement of flying your design for the first time is by far the biggest reward for many hours of design work. I hadn't had a complete motor run yet, but I knew I had a winner.

The first Electraglide 62 had an RS 3-channel installed for rudder, elevator, and motor on-off. I didn't have a 225ma battery



Photos above show method of rolling ply around electric motor, using Titebond aliphatic resin plus Hot Stuff. Masking tape used to hold shape, until dry. Fuselage construction uses keyed formers for perfect alignment. Wing construction is simple, strong, and light.





RS radio installation. Benson solid state throttle can replace third servo, or only two servos can be used with on-off switch.

leave a space in the middle of the tube free of resin so that the Hot Stuff can be applied there during construction. After completing the tube, wrap it with tape and don't remove the tape when the tube is installed. While waiting for the motor tube to dry, cut out all of the fuselage formers and make sure that they fit in the notches in the fuselage sides. Install the 3/16" square balsa support for Former G, and cement in place the 3/32" rear fuselage former. In addition, the 3/32" square rails can be glued in place.

When all of the sub-assemblies are ready, place the motor tube in Formers A and C as shown in the photograph. Place this assembly between the fuselage sides after putting a generous amount of cement on Formers A and C. Note: do **not** cement the motor tube to these formers at this time. Now, cement all of the other formers in place, and tape them until the adhesive sets up. I use 5 minute epoxy, but if you don't feel you can move fast enough, use aliphatic resin. When dry, carefully epoxy the motor tube to Formers A and C. Cut the 1/8" poplar plywood bottom to size and drill the cooling hole where the core of the battery

pack is located. If a wheel is desired, cut a hole for it now, but don't cement the 1/4" plywood brackets in until after you cover the model. Add the 1/8" balsa sheeting to the bottom cross grained and cement the cowling in place.

At this point the pushrods should be installed. It is easier to mount the servos now than after the model is completed so add hardwood mounting blocks as required for your particular RC unit. Note that the top of Former E is never glued in place and can be slipped out of its rails for ease of RC installation. If you haven't guessed the purpose of this piece, it guides cooling air from the intake under the leading edge of the wing over the motor batteries and out the exhaust hole in the fuselage bottom.

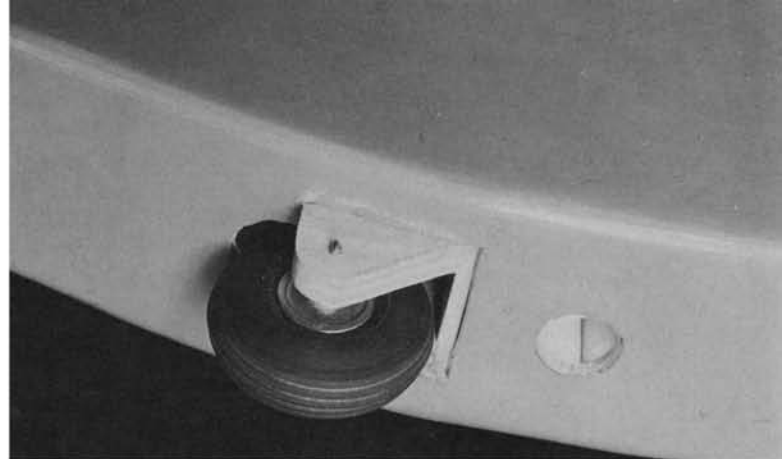
Now the fuselage can be finished by adding the rear top sheeting cross grained. Don't install the wing hold-down dowels until after the fuselage is covered.

The wing is quite conventional and should be no problem for even a novice builder. Stack cut the wing ribs using pins to hold the stack together. Also, cut the spars, tip plates, and dihedral braces to the shapes

shown on the plan. Join the wing spars with the dihedral braces making sure that they both have the same amount of dihedral. Then, pin the leading edge, the spars, and the bottom trailing edge to the workbench over the plans. Cement the wing ribs in place making sure that the tip rib is 3/16" rather than 1/16". Add the bottom sheeting at the center section, cement the top trailing edge piece in place, and glue the tip plate in place. Repeat for the other wing panel and cover the top center section with 1/16" sheet. The plastic paper hooks shown on page 65 of the January 1975 RCM will work just as well and are easy to install. After the wing is covered with any of the covering films, 3/16" washout should be added to each wing tip.

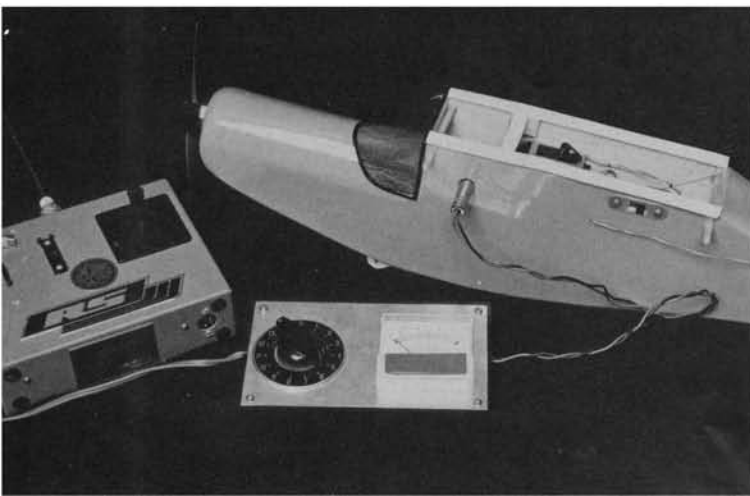
To complete the basic airframe, cut out the fin and rudder and sand to a streamlined section. Build the stab and elevator over the plans and sand to shape. Now cover the fuselage, wing, rudder, and elevator with your favorite covering material. MonoKote was used on both of my Electraglides.

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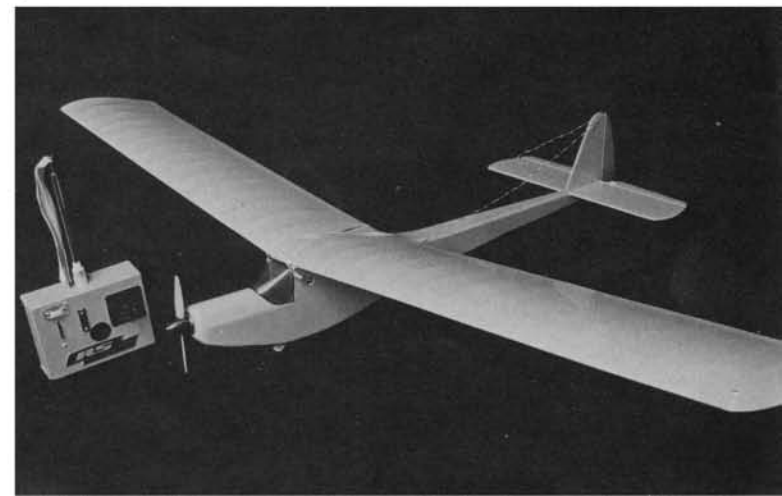


Optional wheel makes for smooth, scale-like landings. Note air exhaust hole behind wheel mount for battery cooling.

The Electraglide 62 being charged on the Astro Flight Rapid Charger. Fifteen minutes gives full flight charge.



Ready to go - whether for general sport flying or thermal soaring, the Electraglide 62 translates to pure flying pleasure.



ELECTRAGLIDE 62

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Epoxy the rudder assembly to the elevator after installing the rudder and elevator hinges. The small Du-Bro hinges were used on the original. At this point the stab can be cemented to the fuselage and the wing hold-down dowels can be installed. After everything else is completed cut out the windshield from sheet styrene and fit it to the fuselage. I have found that the best way to attach a windshield is with a cyanoacrylate cement such as Hot Stuff.

If you are going to install a wheel, now is the time. Make sure you use enough epoxy. After you install the wheel on its axle, a dab of epoxy over each end of the axle will hold it in place.

The wiring diagram I have shown is essentially the same as that recommended by Astro Flight. However, I use pin connectors to attach the motor to the battery, so I don't have to get the soldering iron out every time I want to put the motor in another model. To place the motor in the aircraft, push it in the tube as far as it will go by hand. Then get a pair of pliers and push the "Pup" to the rear of the tube so that the pin connectors can be easily mated. Pull the motor to the front of the tube with the pliers, put on a Cox Gray 6/3 prop and you're ready to go!

For charging, I use an Astro Flight field charger that plugs into my automobile cigarette lighter. I highly recommend this or some other timing mechanism as a charge of more than 20 minutes will destroy the battery. I don't care how careful you are, if you rely on a wristwatch you'll burn up your battery sooner or later.

Before flying, make sure that the model balances according to the plan and check for any warps. Straight models usually fly better! Charge the motor battery for 15 minutes following the Astro 05 Instruction Manual and range test your radio with the "Pup" both on and off. If there is no servo chatter or other problems you're ready for some flying. Hold the model into the wind, turn on the Astro 05, and gently push your Electraglide until you feel it lift out of your hand. Fly out a few hundred feet and put the model in a banking climb. Go easy on the elevator until you get some altitude after which you can feel out your new powered sailplane. Once up to thermalling altitude, turn off the motor and find some lift. At this moment you will know what it's like to be a pioneer in silent powered flight! □