CUSTOMAIRE

SIG

SIGFF26 CLASSIC SERIES

BUILDING AND FLYING INSTRUCTIONS

General Notes

The Customaire is a challenging kit designed for experienced modelers. Basic parts must be accurately built in order to produce a strong, well aligned model. If you haven't already completed a number of rubber powered kits successfully, we suggest that you set your Customaire aside until you have gained some experience on several of the simpler Sig kits.

Even if you are an experienced builder, please read the instructions before beginning construction. A few minutes spent reading may prevent serious mistakes. MANY STEPS MUST BE DONE IN ORDER LISTED IF PARTS ARE TO GO TOGETHER PROPERLY.

Assembling Plastic Parts

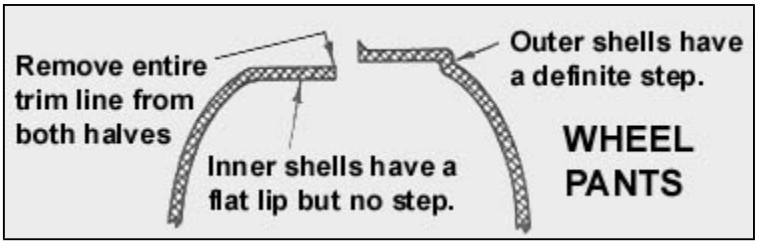
Small scissors are the best tool for cutting out plastic parts. While cutting, hold parts so that the trim line can be seen clearly. Double check with the instructions to BE SURE YOU ARE CUTTING ON THE RIGHT LINE. The edges of the shells and the back surface of the completed cowling assembly can be finished flat and accurate to the desired line by rubbing them across a sandpaper block. Go slowly and carefully.

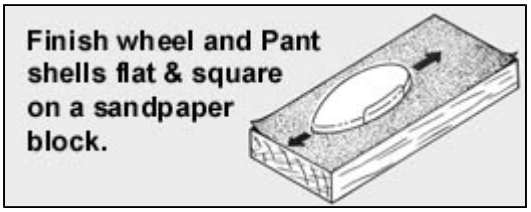
Cement plastic to plastic or to wood with a thin, even coat of Sigment. Other types of cements or solvent may work, but try on test scraps first. Some cements soften plastic excessively, others will not adhere at all. Plastic joints dry slowly.Waif overnight Before-handling.

Most of the paints sold for plastic models are OK on these parts. But before using any kind of paint on your Customaire parts, test it on scrap plastic.

Wheel Pants

Cement L-1 discs to the inside of pants and wheel shells. Allow to dry completely. Pierce or drill the center holes. It's handy to leave holes undersize, enlarging them when parts are complete. This allows holes to be shifted slightly for perfect alignment.

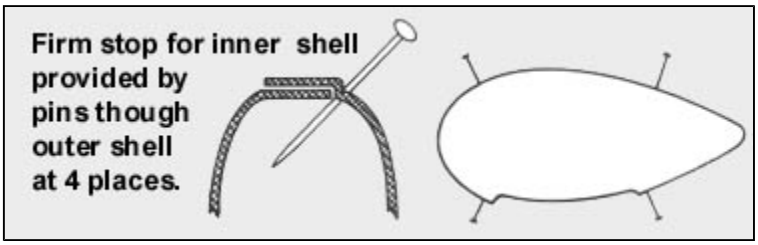


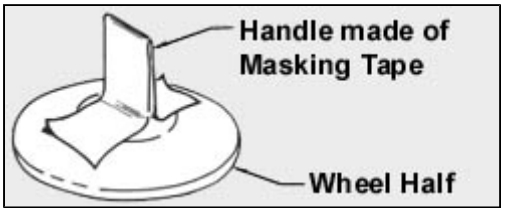


Trim shells from the plastic sheet, finishing them flat on a sandpaper block as shown. Cut the wheel well openings in the pants roughly to shape and finish to exact shape with sandpaper sticks. Make a flat sanding stick by cementing sandpaper to a popsicle stick and a round one from a round pencil or small dowel.

Insert four small pins through the outer shells as illustrated. These provide a firm stop for the inner shells to rest against.

Apply a thin, even coat of Sigment to the inside of the lip of the outer shell and slide the mating inner shell in place.

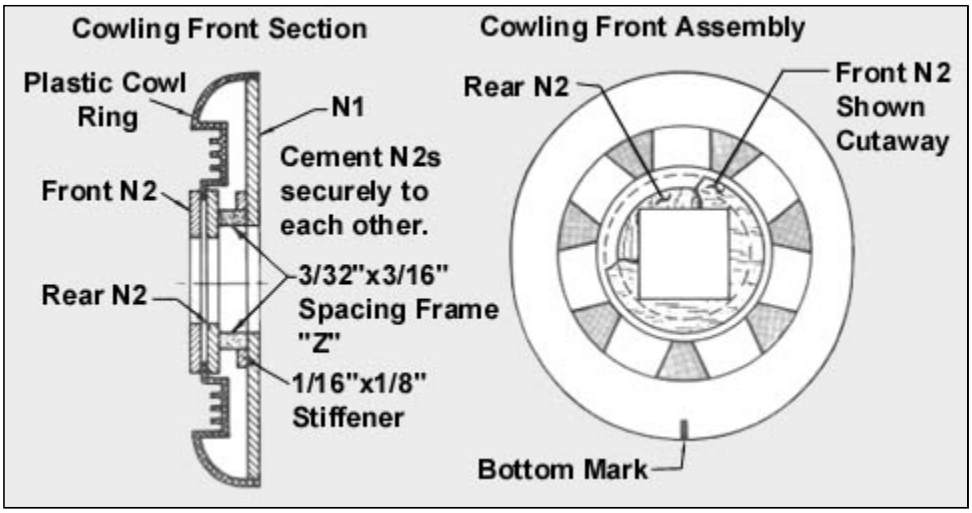




Handles made of masking tape prevent gluey finger marks and make the parts easier to work with.
When parts are completely dry, use a sandpaper block to smooth any sharp edges of wheels and pants. Cement eyelets in wheels, shifting the holes if necessary to prevent wobble.

Cowling Assembly

There is no trim line on the cowling and dummy motor. Just cut from the sheet leaving a small rim around the edge like the brim of a hat. Carefully trim the round center disc from the dummy motor. Remove the small lip at the trim line, leaving the center ring smooth and flat. Apply cement to one surface of each N-2 and place one inside and one outside the cowling, sandwiching the center ring of the motor between them. Turn them cross grained, matching the square cutouts with each other and centering them in the middle of the cowling. N-2s should stick to the cowling AND TO EACH OTHER.



Cement two N-1s together, add stiffeners, and build up the 3/32"x3/16" spacing frame. Try the completed N-1 former inside the cowling. It must fit smoothly without forcing. If necessary, sandpaper the edge of N-2 or build it up with a paper strip to make a good fit. Then remove the former, apply cement to the edges and the front of the spacing frame, and fit it in place permanently. When thoroughly dry, trim away the overhanging plastic, and sandpaper the back surface flat on a sandpaper block.

Fuselage

Match the hardness of the longerons for the right and left sides. MAKE SIDES ACCURATELY, giving special attention to the nose and wing mounting areas.

Complete the following subassemblies before starting the fuselage box frame:

- All former assemblies ("F" parts).
- Bulkhead F-11 and three cross pieces "R".
- Assembly of F-6 and the landing gear wire.
- Cowling and dummy motor assembly.

Now invert the fuselage sides and pin them over the bottom view of the fuselage. Cement cross pieces "R" and the upper part of F-11 in place in the cabin area. When dry, pull the bottom longerons together and finish cementing F-11. Cement cross pieces "S" as shown. THE STRENGTH AND ALIGNMENT OF THE LOWER WING DEPEND ON THE ACCURACY OF THIS OPERATION. Now add F-2, 1, 6, 5, 9, and 10. Complete the main frame by drawing the fuselage sides together at the tail and installing the remaining cross pieces.

When adding the 1/16" sq. stringers, note that the stringer J is bevelled to fit against the lower longeron at F-6. The rear ends of K, L, M, and N are supported by a piece of 1/16" sq. cemented to cross piece "S".

Before attaching the cowling and motor, carefully position the completed cowling assembly on the front of F-1. F-1 should be 1/32" smaller than the cowl all around the edge to allow for the 1/32" sheet covering. If F-1 is too large, sand the edge where required. If F-1 is too small, cement paper strip around the edge to build it up. When the 1/32" allowance is correct, remove the cowling assembly and fit the sheet covering in place. Wherever the edges of the sheet butt together, cement a 3/32" sq. support between F-1 and F-2. Sandpaper the front surface of F-1 flat with a sanding block and cement the cowling assembly in place.

Tail Surfaces

Build over the plans using the die cut and strip balsa parts called for. Cover both sides.

Landing Gear

Building the wheels and pants is described in "Assembly of Plastic Parts". Cement L-2s and L-3s together to make lower struts, leaving the 1/32" groove for the landing gear wire. Round the edges. The lower struts are now used as forms for making the upper shock struts.

Cut two 1-1/8" by 7" shock strut strips from typewriter paper. Also cut two 1-1/2" squares from wax paper. Wrap a lower strut in wax paper, and then wrap a paper strip snugly around the outside, thoroughly cementing the layers of paper together as you wrap. When cement has started to set up, the wax paper will allow the shock strut to be slipped off the form. Discard the wax paper. When shock struts have dried completely, they can be cut and sanded almost like wood. Bevel the upper and lower struts as shown in the drawings. BE SURE TO MAKE RIGHT AND LEFT HAND PAIRS OF STRUTS.

Now, by turning and sliding, the struts can be worked onto the wire landing gear legs, one piece at a time. Adjust to proper length and position. Add wheels and pants to the axles. Cement lower struts to the pants and the wire. Cement upper strut only to the lower strut. DO NOT CEMENT THE STRUTS TO THE FUSELAGE. Leave about a 1/16" gap to allow the landing gear to flex.

Top Wing

Accurately assemble the center section consisting of leading and trailing edges, pieces marked "B", and W-1 ribs. Pin firmly to plans. Do not add "F" pieces yet. Now build the outer panels, fitted against the center section, but not cemented to it. Cut notches in "A" pieces before cementing in place. Note that W-5 is glued on top of T-1, and W-4 rests on top of a piece of 1/16" sq. A pre-bent piece of 1/16" sq. is used to round out the leading edge on top of T-3.

Remove the three wing panels from the plans and bevel the ends of the center section to match the outer panels when they are supported by the cardboard dihedral jigs. BE SURE THE DIHEDRAL JIGS ARE IN THE PROPER LOCATION, then cement the leading and trailing edge joints. Carefully fit the four dihedral braces marked "D" and "E" in place. Pieces marked "F" are then securely cemented above them in rib notches. All joints of D, E, and F should be coated with cement a second time.

Lower Wing

Lower wing panels are built in the usual way. Note that the tip ribs are made of 1/16" sq. scrap cemented on top of T-4 and sanded to shape after panels are complete. The 3/32" sq. piece that forms the trailing edge cutout is tapered to blend into the trailing edge in the same way.

Struts

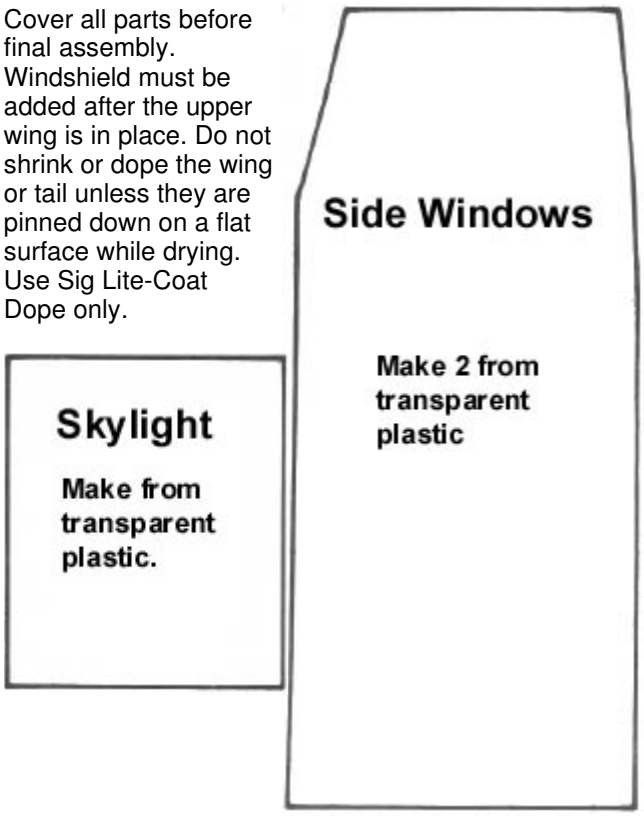
Cement 1/16"x1/8" strips right on the Krome-Coat patterns. When dry, cut from the sheet with a sharp blade and round the edges slightly. Bevel the lower ends as shown on the front view.

Nose Plug

Assemble nose plug from parts shown on the plans. Round the front of the crankcase as shown. Cement eyelets securely. If the hole for the propeller shaft ends up at a slight angle, rotate the plug so the propeller will point downward. Then mark the top of the block so you will aways plug it in the same.

Covering

Cover all parts before final assembly. Windshield must be added after the upper wing is in place. Do not shrink or dope the wing or tail unless they are pinned down on a flat surface while drying. Use Sig Lite-Coat Dope only.

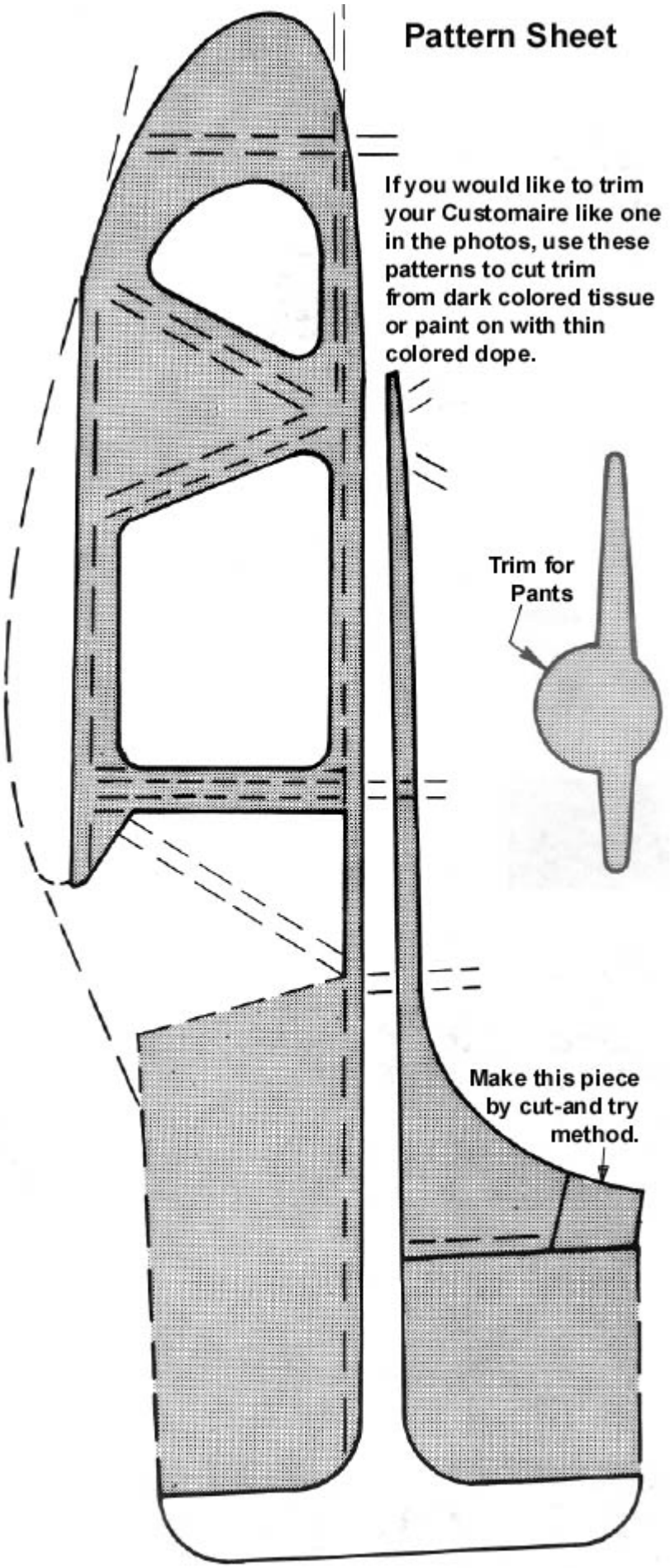


WING SURFACES MUST BE FREE OF WARPS OR THEY WILL NOT FIT PROPERLY IN FINAL ASSEMBLY.

Final Assembly

Don't try to cement parts to the paper covering. Wherever parts are to be joined, remove a small section of paper to expose bare wood for a gluing surface.

Spot-cement tail surfaces lightly in place. DON'T FORGET THE 1/16"x1/8"x1/8" INCIDENCE BLOCK UNDER THE STABILIZER. Cement the top wing in place on the fuselage. Check the correct location with the plan and align.



Bevel the inner ends of the bottom wings slightly so they fit against the fuselage when they are held parallel with the top wings. Support the fuselage upside down so its weight is not resting on the wing tips. Center the top tabs of the N struts in the slots in the top wing and cement very lightly. (They may have to be moved later.)

Use two pieces of masking tape to hold the ends of the bottom wings in place on the fuselage. Leading and trailing edges butt against the ends of the cross pieces "S". Insert the bottom tabs of the N struts into the slot between the double ribs in the lower wings. The struts should fit against the ribs without distortion.

Struts can be moved forward or backward slightly in the slots, or sprung a little for improved fit. If wings are well aligned and struts still will not fit, the struts will have to be trimmed or made over. DO NOT WARP WINGS TO MATCH STRUTS. When fit is correct, cement, cement the strut ends lightly to wing ribs, and the wings to the "S" pieces. Don't cement tabs in slots. Tabs add no strength, but are useful in alignment and repair.

Numbers For Top Wing

NC1941

Windshield

Use pattern to check fit then cut from transparent plastic.

(Dotted edges may need to be trimmed)

Numbers For Bottom Wing

NC1941

FLYING YOUR SIG CLASSIC

Now you are ready to fly your plane, and FLYING is what the Sig Classic models are designed for. Most models as realistic looking as your Classic make poor flyers. They're often tricky to adjust and clumsy in the air. But Sig's Classic kits give you three important features that assure you of successful flights:

1. A PROVEN flyable design.
2. A reliable way to make flight adjustments.
3. Complete flying instructions.

Read and follow these instructions carefully. They are the key to satisfying flying.

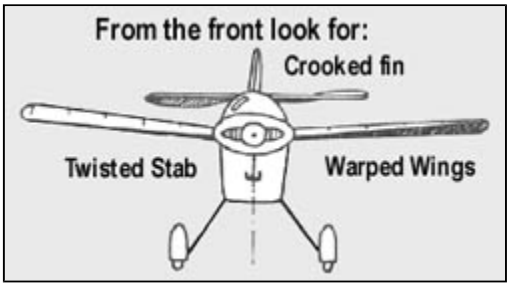
Testing And Adjusting

You have invested a lot of time and effort in building your model, don't waste it all now with careless testing. Most models fail to fly because of poor adjustment, not poor craftsmanship. Be as careful in your testing as you were in your building.

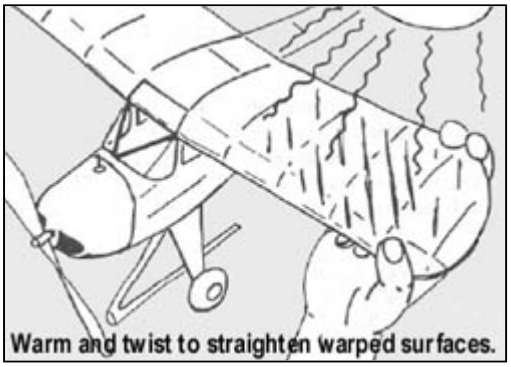
Every model is a little different and needs its own special set of adjustments. Contest winning flyers make dozens, even hundreds, of test flights "trimming" a model for best performance. So don't give up if your first flights aren't perfect.

Preflight Preparations

Before you leave the workshop for the flying field, take these important steps.

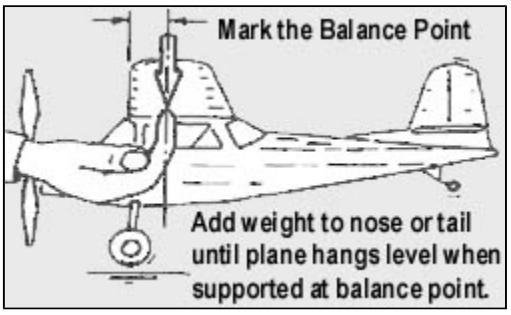


Looking from the front of the model, check that the bottom of the wing and tail surfaces are flat - not twisted. Sight down the center line of the fuselage as shown in the drawing. Right and left wing should look alike; you shouldn't see the top of one wing and the bottom of the other. The fin should point straight ahead, and the stabilizer should be flat. (This does not mean that the stabilizer and the wing sit on the fuselage at the same angle. The wing will be tilted upward more than the tail).



A model can be made to fly with twisted surfaces, but it's confusing to adjust and if the warps change from day to day, you can't detect it. The drawing shows how a surface can be straightened by twisting it in the desired direction while holding it under a heat lamp or other electric heater. Work with it until it is as flat as possible. If your wing has struts, loosen them before bending and re-cement them afterward.

The correct "Balance Point" for your ship is shown on the plans. Mark this point on the bottom surface of each wing. When supporting your plane on your finger tips at these points, the fuselage should hang level. See the drawing. Add weight to the nose or tail until it DOES hang level. Don't be afraid to add the necessary weight. CORRECT BALANCE IS MORE IMPORTANT THAN LIGHT WEIGHT.

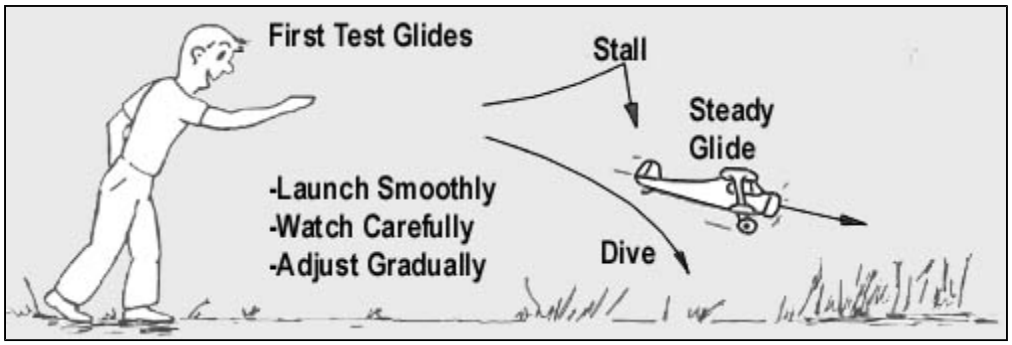


Modeling clay makes handy balancing weight - it can be pressed permanently in any corner. Wire solder or BB shot can be used by cementing in place.

If one blade of your propeller always swings to the bottom, a tiny smear of clay on the other tip will improve the prop's balance and reduce vibration.

Power-Off Tests

A rubber-powered model is adjusted in two steps. First, the tail surfaces are adjusted to produce a good glide. Then the propeller assembly is adjusted to give a smooth, powered flight. Wait for a calm day.

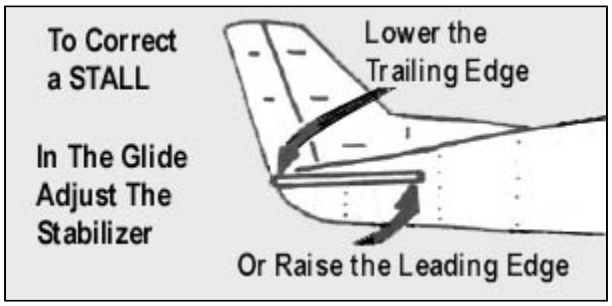


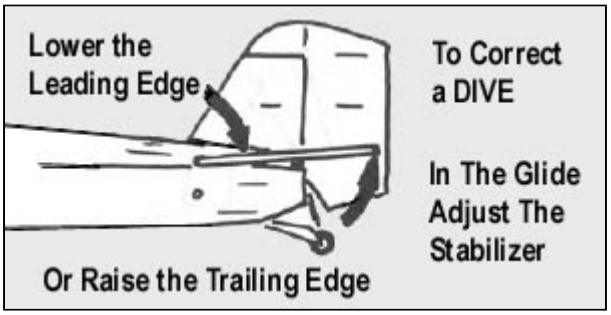
Begin by gliding the model from your hand into a patch of tall grass. Grasp the ship by the fuselage near the balance point, and aim the nose at a spot on the ground about twenty feet in front of you. Launch the ship forward about the way you would a paper dart airplane, nose down.

Your goal is a steady glide to the ground, moving at a CONSTANT SPEED, and travelling straight ahead or turning gently. You will find the trick is to launch the model at its natural speed and glide angle. If the glide is poor, it can mean that the ship needs adjustment or that you need more launching practice. So try several launches before deciding on adjustment changes. When your ship acts the same way on each launch, you can be pretty sure that you are seeing its true characteristics, and not just a poor launch.

Stalling

If your plane noses up, LOSES SPEED, and then falls clumsily or dives, that is a STALL. To cure a stall, adjust the angle of the stabilizer by changing the thickness of the incidence block under it. Lower the front edge or raise the rear edge. See drawing. But make SMALL changes - 1/32" at a time. If a change of more than 1/16" is needed, go back and perform the Preflight checks again. It's likely your Classic is incorrectly balanced (tail-heavy) or the surfaces are warped.





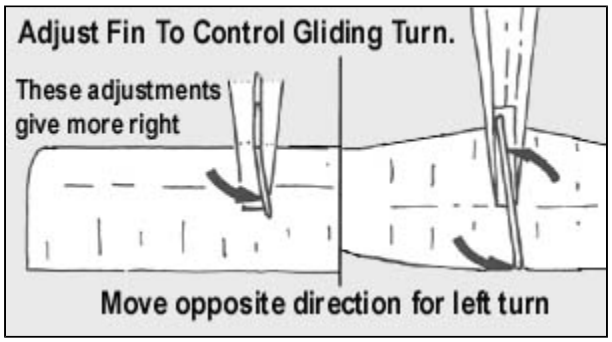
Diving

A model that darts quickly into the ground without swooping or stalling, is diving. The dive can be cured by adjusting the stabilizer in the direction shown in figure 5 (in 1/32" steps). Here again, don't change the height of the incidence block more than 1/16" without first re-checking the Pre-flight steps. Warps or nose-heaviness may be causing the dive.

Turning

A plane that glides in a straight line takes a lot of flying space and a lot of chasing, so it's best to adjust the glide for a slight turn. The plans for your model will tell which direction.

The size and direction of the glide circle can be controlled by adjusting the fin. The drawing shows adjustment for a right turn. Moving the fin opposite, of course, gives left turn.



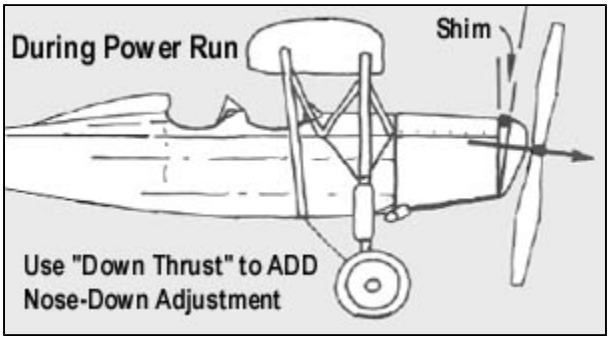
Small changes in fin setting can be made by bending the surface. But if more than 1/32" or so of change is required, cut the fin loose and re-cement it at the desired angle. When the glide is smooth and steady, you are ready to go on to powered tests.

Power-On Flight

ALL ADJUSTMENTS TO THE "WOUND UP" PART OF THE FLIGHT ARE MADE BY POINTING THE PROPELLER AND NOSEBLOCK IN THE DIRECTION YOU WANT THE PLANE TO GO. This kind of adjustment affects only the powered flight, and will not upset the glide pattern you have developed.

Now - wind the propeller l-50 turns and launch your Classic into the wind with the same motion you used in glide testing. The model should cruise steadily forward, turning in the desired direction, and gaining or loosing altitude gently.

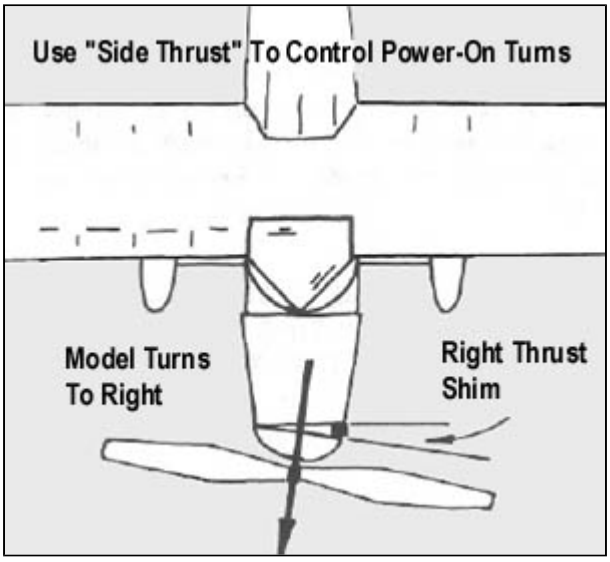
If your ship tries to climb, but loses speed and stalls, point the propeller downward by slipping a scrap of 1/32" balsa or a paper book match between the top of the noseblock and the front of the fuselage. The wedge is called a "shim" and the adjustment is called "downthrust". Downthrust is illustrated in the drawing.



It's not likely that your plane will dive on first power flights, but if it should, put the shim at the bottom of the noseblock, tipping the propeller upward (upthrust).

Downthrust is the "magic adjustment" that can make experts out of beginners. Learning to use it is the most important part of your test program.

Increase or decrease the amount of downthrust (by changing the thickness of the shim behind the noseblock) until power flights are smooth and free of stalling with 150 winds in the motor. Don't wind the motor any tighter until the lower-powered flights are under control.



Power-On Turns

Because of the effects of the rotating propeller, models usually turn better in one direction than the other. Your plans will say which way to circle.

Don't circle any tighter than necessary. Circles smaller than about 50 ft. diameter are tricky. If you have plenty of flying space, turns can be as large as you like.

The drawing shows how side thrust is used to control power-on turning. Making small changes, 1/32 at a time, adjust downthrust and sidethrust together to produce smooth flights on 150 winds.

You may notice that turning to the right tends to hold the nose down-right thrust acting a little like downthrust. If your plane begins to circle so sharply that it loses altitude in a steep bank, reduce the amount of sidethrust until the turn opens up to a safer size.

Longer, Higher Flights

When your Classic is flying smoothly with 150 turns in the motor, wind to 175 and try it. Make any necessary noseblock adjustments, and then wind to 200, and so on. The safe number of turns that your motor will stand is shown below.

Rubber Motor Winding Chart								
Length of Loop 1/4"		10	11	12	13	14	15	16
Safe Number of Turns	Hand Wound	180	200	220	235	250	270	290
	Stretch Wound	440	485	525	570	615	660	700

A plane's weight determines how much power it needs. If your ship is huskier than average, it may not climb, even when fully wound. In that case, add one strand (not a complete loop) of 1/8" Sig rubber to the motor. Tie an eye (like a slip knot) in each end. This will provide the extra horse power needed for higher climb.

Whenever you add rubber, re-balance your model as outlined in the pre-flight instructions. Additional rubber tends to make a plane tail heavy.

Take-Offs

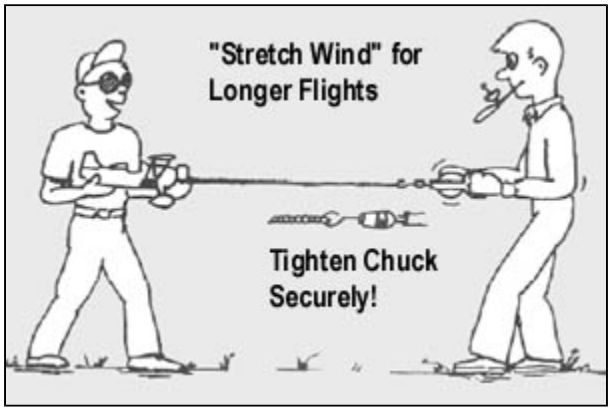
When your Classic has been adjusted according to instructions, it should have no trouble taking off by itself from a smooth surface. No adjustment changes should be necessary. You may find that take-offs are better if you release the ship pointed at a slight angle to the wind instead of headed straight into it. Experiment to find the best system.

Rubber Motor Hints

The rubber motor in your Classic kit will safely give you a whole season of flying if you stick to the chart. "Hand Wound" means winding the propeller with your finger while the rubber is inside of the fuselage. "Stretch winding" is a more complicated two-man operation, but gives longer flights.

Before a motor can be safely stretch wound, it must be lubricated. Rub a few drops of Sig Rubber lubricant into the rubber (AFTER the knot has been securely tied). Use just enough to make the motor barely damp. If it's too juicy, it will splatter all over the inside of the fuselage. Next, make a strong wire hook, like a teacup hook, and lock it VERY TIGHTLY in the chuck of a hand drill.

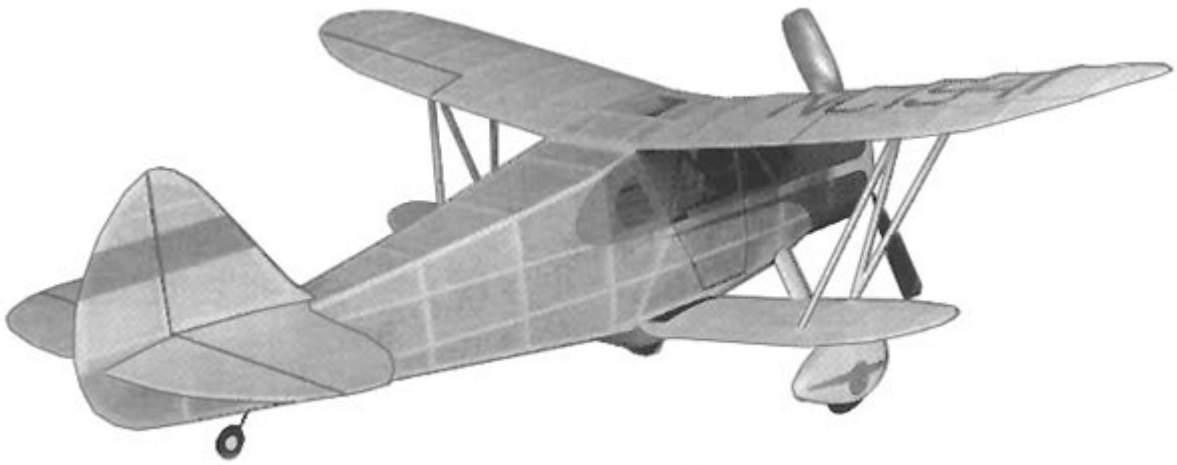
Then, while your helper holds the model by the rear rubber peg and the cowling, stretch the motor out the front of the model to about twice its normal length, unhook the propeller, hook up the winder, and wind while slowly walking back toward the plane.



All the models in Sig's Classic series have been carefully designed and flight tested to assure flying ability. Hand wound, you can expect flights of 10 to 25 seconds and stretch wound, 20 to 50 seconds. Like model builders, some of the designs have more ability than others, but all are proven dependable flyers.

A Classic flying model is not a ready-to-fly toy. Your skill in building and flying DOES make a difference. So whether your flights are short or long, you can be proud of completing a job which was successful because of your own effort and ability.

Good Flying!



SIG MFG. CO., INC. is totally committed to your success in both assembling and flying the Customaire. Should you encounter any problem building this kit or discover any missing or damaged parts, please feel free to contact us by mail or telephone.

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