Tiger

SIGFF22 CLASSIC SERIES

BUILDING AND FLYING INSTRUCTIONS

General Notes

As you work on your Tiger, study the plans and this instruction sheet. Proceed step-by-step, in the order suggested, and most problems just won't happen.

Prevent framework and plans from sticking together by covering plans with transparent kitchen wrap.

Don't remove parts from the die-cut balsa sheets until you are ready to use them. Carefully use a stiff backed razor blade to free stubborn pieces. Trim the scrap wood away from the outside of the part in small pieces. Prying or forcing may damage the part.

Don't push pins through small balsa pieces. Hold the parts in place over the plans with pins on each side not through the middle.

If balsa strips must be bent, soak them first in water. Use lots of pins to hold the curved shape. Allow to dry overnigh t before cementing other parts to them.

Don't Hurry! When a part has been soaked or cemented, wait for it to dry completely before going ahead. While that assembly is drying, work on some other part.

Always cement your sandpaper to a block. A 3-inch length of l"x2" lumber is a handy size.

Use Sig-Bond or Sig-Ment to assemble balsa frameworks. Do not use cement made for plastic models. Attach tissue with full strength clear dope. If you dope the covering, use only Sig Lite-Coat dope. Ordinary dope will shrink the tissue too much, causing the surfaces to warp.

MAIN CONSTRUCTION

Building The Fuselage

- Start on the main frame of the fuselage, but while you are waiting for the glue to dry on the large parts, build some of the small assemblies - then they will be ready to use when you need them.
- Build one Bulkhead B-4 over the plans and lightly cement the temporary brace to it while it is still pinned to the plans.
- Cut five 3/32" square cabin spacers to length shown and set them aside with B-4 to be used later.
- All three nose formers, B-1, B-2 and B-3, are made from two thicknesses of balsa for extra strength. Cement them together exactly as shown - matching carefully with the drawings. When dry, pin them over the drawings and mark the stringer locations as illustrated.
- Cement together two N-1s and the two "plugs" from Former B-1 to make the plug-in noseblock. Use B-1 as a pattern when cementing the plug in place. The noseblock will be completed later.
- Bend the landing gear wire and glue it between two L-1s, following the instructions on the plans.
- Assembly of the tailskid is also described on the plans.

Main Fuselage

- The fuselage side frames are built entirely of 3/32" square balsa. Select strips of the same hardness for the longerons. Then the right and left sides will bend equally, giving a true, accurate fuselage.
- Build the two frames one on top of the other over the shaded outlines on the plans. When they are dry, remove from the plans and very carefully separate the sides from each other with a thin razor blade. Then add F-1, F-2 and F-3 to each frame.
- Now is the time to mark the Balance Point on the outside of each frame.
- You are now ready to join the sides together to form a box structure.
- Turn the frames upside-down over the top view of the fuselage, resting the flat area where the wing mounts on the plans. Match up the sides with the plans in the wing mounting area, and hold with pins. Cement Bulkhead B-4, and then the five cabin spacers in place. Lightly cement two 3/32" square diagonal pieces across the inside of the cabin - one on top and one on the bottom. This strong fuselage box gives an accurate start for your Tiger's fuselage assembly.
- Cut the front and rear fuselage clamps from the cardboard sheet.
- Cement the rear ends of the fuselage frames together and push the rear clamp over the ends far enough to hold them until the cement dries. Complete the rear end of the fuselage by cutting the remaining three pairs of 3/32" square fuselage spacers to proper length and cementing them in place.
- Cement the front ends of the fuselage sides in the grooves in the edge of B-1. Slide the front clamp over the nose to hold while the cement dries. Now cement B-2 and B-3 to the top of the nose and add the corresponding 3/32" square spacers on the bottom.
- When glue is dry, remove the fuselage from the plans and add the three 1/16" square stringers to the nose.
- Round the noseblock roughly to shape with your sandpaper block, then plug it into the fuselage and sand to final shape - matching the lines of the fuselage and the shape shown on the plans.
- Enlarge the center hole in the noseblock with a drill or small nail and cement the two eyelets in place. Be sure the propeller shaft turns freely in the completed noseblock assembly.
- Cement the landing gear assembly in place and reinforce with gussets L-2 glued to L-1 and to the inside of the fuselage frames. Use plenty of cement on these joints.
- Install the tailskid assembly. Now your Tiger's fuselage is complete. The three temporary diagonal pieces in the cabin area can be cut loose and thrown away.

Tail Surfaces

Build the fin and stabilizer over the plans, using wood sizes and die-cut parts called for. Make joints accurately to reduce warping when the frames are covered.

Wing

The wing is built in three steps. First, a center section is built as a foundation. Then the right and left wing panels are assembled - matched to the center section, but not glued to it. The final step is attaching the two panels to the center section at the correct dihedral angle.

1. Accurately build the flat rectangular center section frame from pieces of 1/16"x1/8" balsa strip. These pieces are called C-1 and C-2 on the plans. Push a couple of pins through the C-2s to hold the frame down securely. This frame is not removed from the plans until the wing is completely assembled.

2. Next, build the right and left wings over the plans. The spar, and the leading and trailing edges all rest against the center section but are not glued to it.

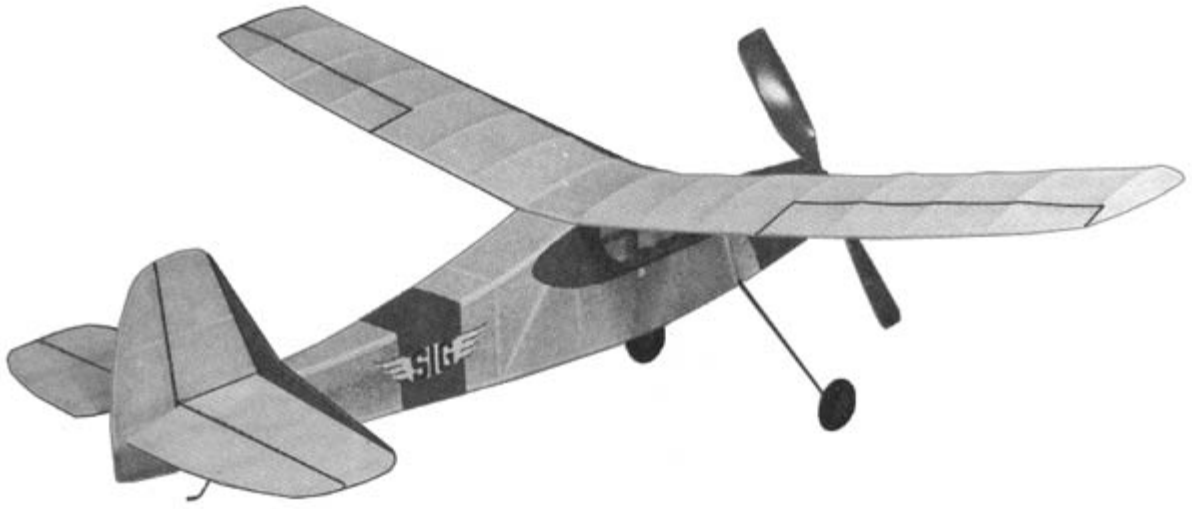
- Cut two C-3 pieces from 1/16"x3/16" strip balsa, using the pattern on the plans.
- Before installing the W-1 ribs, set the two C-3s in place on top of the center section frame, one on each side of the spars. Now fit W-1s in place. If the ribs don't slide easily over the spars and C-3s, enlarge the notches in the ribs until they do. Then cement W-1s to the wing panels but not to C-1, C-2, or C-3. Don't cement anything to C-3 yet. Don't forget to cement gussets W-7 in place.
- When the wing panels are dry, loosen them from the plastic protecting your plans and lift them away from the center section, leaving it still pinned firmly in place.
- While the panels are off the work bench, round the leading edges with a sandpaper block and do any other necessary touch-up work with glue and sandpaper.

3.

- Now the panels are ready to be attached to the center section. Cut out the cardboard dihedral jigs and bend over the ends as shown.
- Use white glue for this job, and work with one panel at a time. Put small dabs of glue in the following places: on the inner ends of the leading edge, trailing edge, and spar; on C-2 where C-3 will sit; and on W-1 where it will touch C-2. Then put the C-3 pieces and the wing panel back in their original positions over the plans.
- Lift up the tip of the wing and slide a dihedral jig to the location shown on the plans. Be sure that the inner end of the wing fits neatly against the center section and that it rests flat on the plans. Don't use pins or heavy weights to hold it in place - they might cause a permanent twsit in your wing. A small weight, like a quarter, resting above each W-7 may be helpful.
- When the wing panel is resting naturally in place, and the glue has begun to set, take a sharp stick and carefully spread a film of cement all along the crack between each C-3 and the wing spar.
- Let these joints dry well and then attach the other wing panel in the same way. Then add the small 1/16" square strip on top of C-1 to round out the leading edge of the center section.
- When all joints have had plenty of time to dry, the wing can be removed from the work bench.

> IMPORTANT: As soon as your Tiger's wing is lifted from the bench, take your glue stick and coat all C-3 joints. Spread a skin of glue over all the cracks between C-3 and mating parts - anywhere that a C-3 touches another piece: at C-2, at the notch in W-1, and all around the outside edge of C-3 where it lays against the wing spar.

- Round the leading edge of the center section and your wing is ready to cover.



Covering

If you Inspect the covering material carefully, you can see that the tissue has a "grain", like a piece of balsa. The fibers all run the same direction. Covering is much easier if you attach the tissue with the fibers running the long way of the framework - nose-to-tail on the fuselage, tip~to-tip on the wing and tail.

Cover the wing and tail on both sides with light-colored tissue. Each side of the fin and stabilizer can be covered with one piece. The top surface of the wing will have to be done with several small pieces near the tip. Do not cover the bottom of the center section.

To reduce the chances of warping, it's best not to water shink or dope the wing and tail. The paper will tighten slowly anyway as the result of weather changes. The fuselage can be covered in large sections - but use as many pieces as necessary to get a smooth job. The fuselage covering can be tightened with a fine water spray and given a coat or two of Sig Lite-Coat Dope if you like.

Windshield And Windows

Cut out the windshield pattern from the plans and tape it to the clear plastic. Then cut out the plastic windshield. Fit the windshield to the cabin as shown on the plans, and hold it in place with three pieces of masking tape - one at the top, and one on each side.

Here's a trick that makes attaching a windshield much easier. Once the plastic is fitted smoothly in place and held with tape, don't ever take it completely off again. While you're working on the right ear, leave the left and center flaps taped down. Then tape the right ear down again before you loosen one of the others.

The side flaps will overhang the window framework and will have to be trimmed to fit. Don't try to mark on the plastic. Lay a small strip of tape along the line where you want to cut, then loosen the ear and trim with scissors.

Cementing the plastic to the fuselage is done in three steps. Use Sig-Ment or contact cement - white glue doesn't stick well to plastic. Loosen the tape holding the center windshield flap to the top of the fuselage only. Lift the flap and apply a thin coat of cement to the spacer beneath. Then tape the flap down again.

Do the side flaps one at a time in the same way, but allow each flap to dry before starting on the next.

Cut side windows to shape and cement carefully in place. It's not necessary to remove the tissue under these glue joints. Dark colored tissue can be used to trim the window outlines and cover up the cemented edges of the plastic.

Assembly

Never cement parts to the tissue covering. Always remove a small patch of paper to expose the bare wood underneath before attaching another part. It's stronger, and better looking, too.

The easiest way to do this job is to cut the tissue carefully around the area where the glue joint is to be made, loosen it with a drop of dope thinner, and then lift off the patch with a pin.

Cement the 1/16"x1/8"x1/8" incidence block to the fuselage and then cement the stabilizer in place with three small spots of cement. DO NOT FORGET THE INCIDENCE BLOCK.

Cement the fin to the rear of the fuselage with two spots of glue and to the front of the stabilizer with one spot. Look from the front of the fuselage to be sure that the fin points straight forward.

Attach the wing to the fuselage with six cement spots.

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.

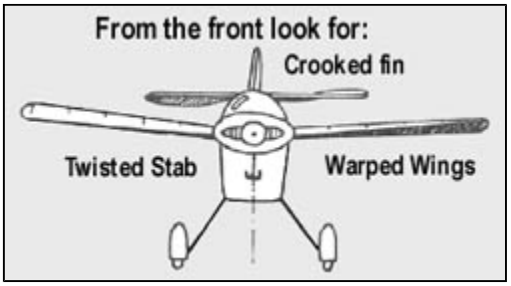
Testing And Adjusting

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.

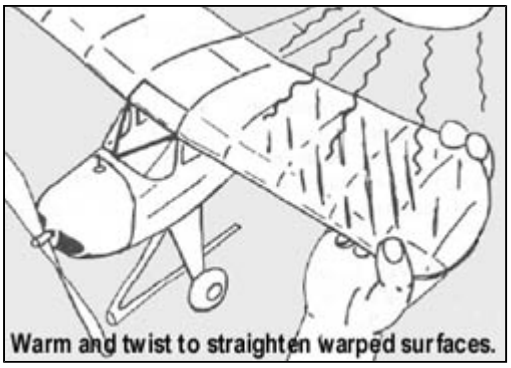
Every model is a little different and needs its own special set of adjustments. Contest winning flyers make dozens, even hundreds, of test flights "trimming" a model for best performance. So don't give up if your first flights aren't perfect.

Preflight Preparations

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



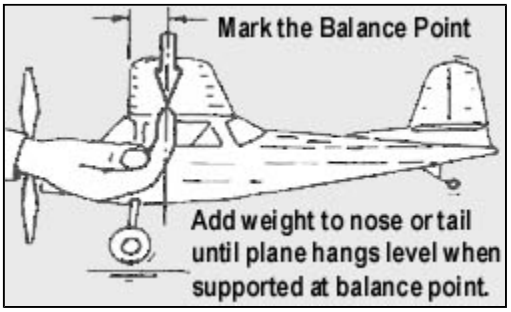
Looking from the front of the model, check that the bottom of the wing and tail surfaces are flat - not twisted. Sight down the center line of the fuselage as shown in the drawing. Right and left wing should look alike; you shouldn't see the top of one wing and the bottom of the other. The fin should 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.

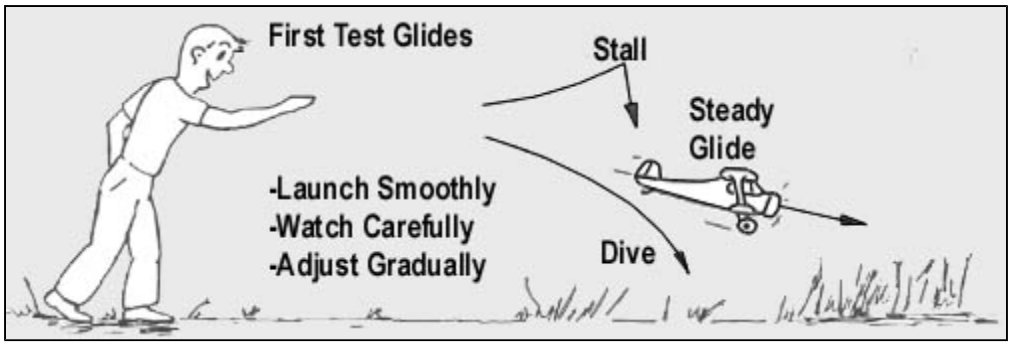
Modeling clay makes handy balancing weight - it can be pressed permanently in any corner. Wire solder or BB shot can be used by cementing in place.



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.

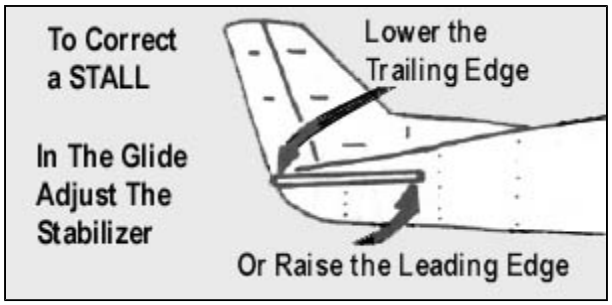


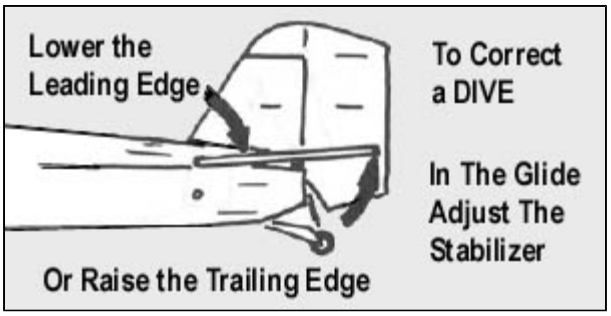
Begin by gliding the model from your hand into a patch of tall grass. Grasp the ship by the fuselage near the balance point, and aim the nose at a spot on the ground about twenty feet in front of you. Launch the ship forward about the way you would a paper dart airplane, nose down.

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.





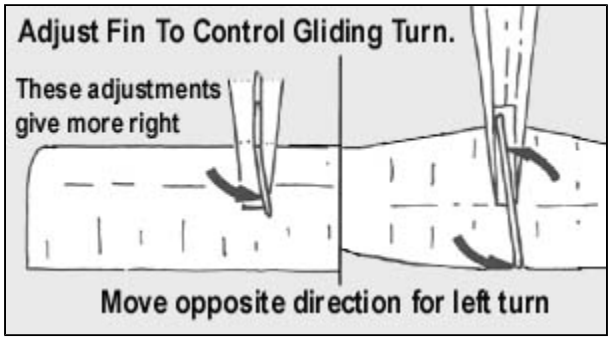
Diving

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.



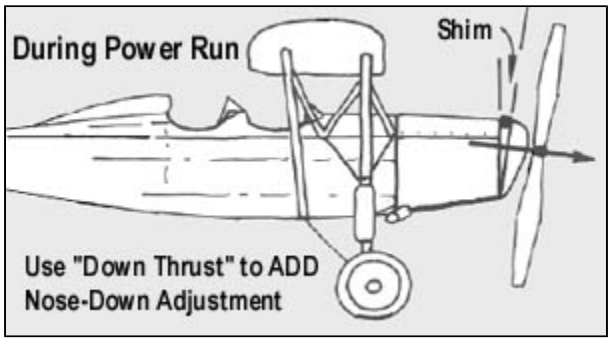
Small changes in fin setting can be made by bending the surface. But if more than 1/32" or so of change is required, cut the fin loose and re-cement it at the desired angle. When the glide is smooth and steady, you are ready to go on to powered tests.

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.

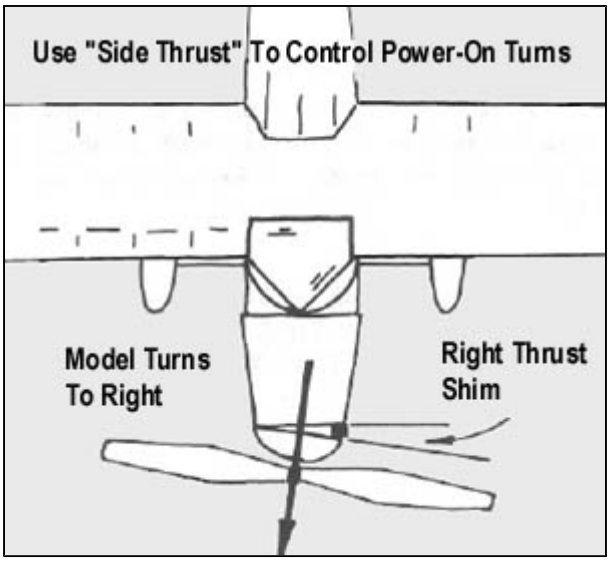
If your ship tries to climb, but loses speed and stalls, point the propeller downward by slipping a scrap of 1/32" balsa or a paper book match between the top of the noseblock and the front of the fuselage. The wedge is called a "shim" and the adjustment is called "downthrust". Downthrust is illustrated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

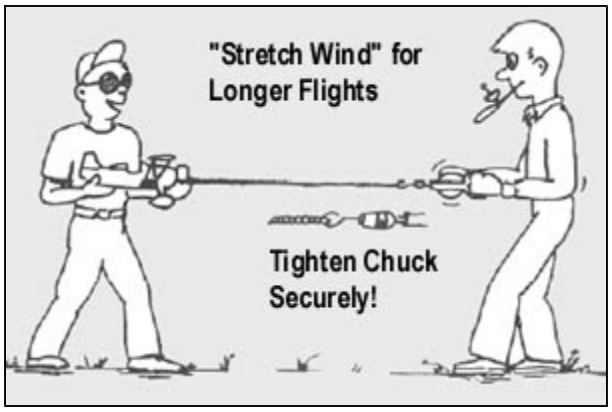
The rubber motor in your Classic kit will safely give you a whole season of flying if you stick to the chart. "Hand Wound" means winding the propeller with your finger while the rubber is inside of the fuselage. "Stretch winding" is a more complicated two-man operation, but gives longer flights.

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.

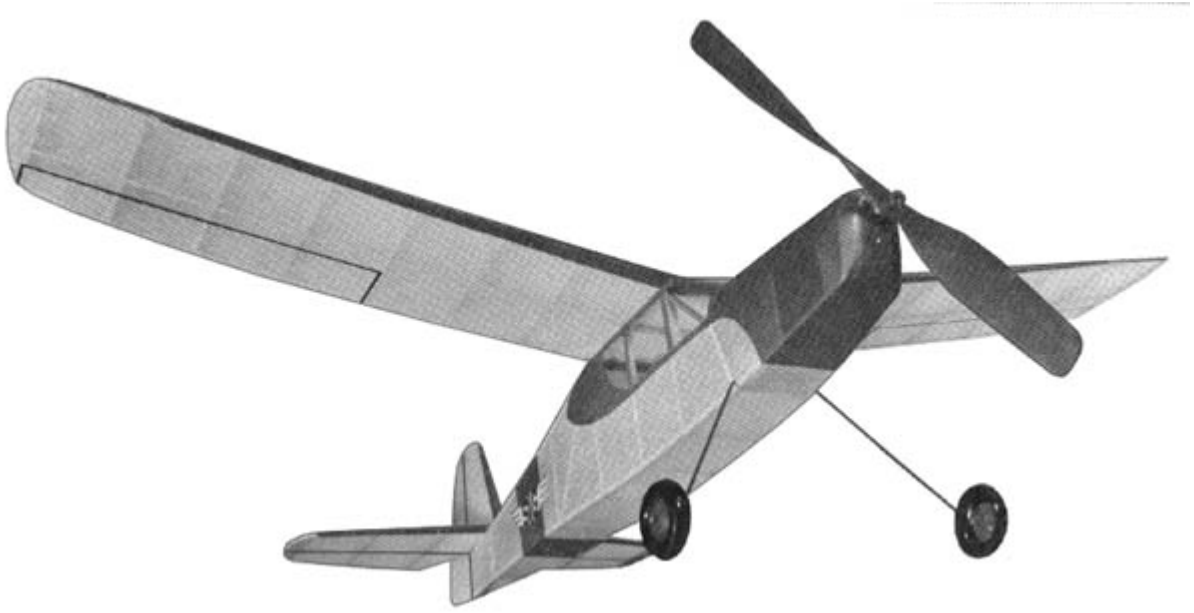
Then, while your helper holds the model by the rear rubber peg and the cowling, stretch the motor out the front of the model to about twice its normal length, unhook the propeller, hook up the winder, and wind while slowly walking back toward the plane.

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!



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