SIGFF25 CLASSIC SERIES

BUILDING AND FLYING INSTRUCTIONS

General Notes

The Monocoupe is one of the all time classic lightplanes. The first Monocoupe was designed and built in 1927 by Clayton Folkerts, an Iowa farmer, who later won fame as a racing airplane designer. Original production was by the Velie company, an early automobile manufacturer. Later production was moved to St. Louis' Lambert field where the 90A with a Lambert five cylinder radial was produced. The plant moved to Florida where production continued until the late 1940's with a variety of models and engines. The Monocoupe was always known for its exceptional performance compared to other light planes of comparable power. It is said that Benny Howard was so impressed by the Monocoupe's performance that he patterned the famous Mr. Mulligan racing plane after it.

The model Monocoupe duplicates the fine performance of the real airplane. With the plastic propeller and rubber supplied in the kit it will fly for about 20 to 30 seconds and travel several hundred feet. With the contest propeller shown on the plans and more rubber, it will exceed one minute's duration when properly trimmed. Only slight changes from exact scale were required to make the Monocoupe a very stable model. These are a two degree increase in dihedral and a 20% increase in stabilizer area, neither are very noticeable.

The following tools and materials will help in building:

- A flat, soft wood board or piece of composition board for a working surface. It should be perfectly flat, about l'x2', and about 1/2" thick.
- Sig-Ment model cement or Sig-Bond glue.
- A 4 oz. bottle of clear dope, preferably Sig Lite-Coat low-shrink type.
- Bottles of black, red and white Sig Supercoat dope.
- Epoxy glue or a soldering iron and acid core solder.
- Dope thinner for cleaning your brush.
- About 100 straight pins.
- Plastic food wrap or wax paper.
- Pliers, preferably long nose type.
- A single-edged razor blade or model knife.
- A ruler.
- A soft bristle brush about 1/4" wide.
- Sandpaper, 220 grit or finer.
- Modeling clay.

It is a good idea to read through the instructions completely once or twice before starting the actual construction of your model.

MAIN CONSTRUCTION

Fuselage

Lay the plans on the work board and cover them with plastic wrap to keep the cement from sticking to them.

- Begin by making the sides directly on the plans using pins to hold the parts in place while the cement dries. Build the second side directly on top of the first so that they are identical. While the cement is drying you can begin other parts of the airplane. When the sides are thoroughly dry remove them from the plans and carefully separate them with your razor blade or model knife. Now cement the sides together at the back and install formers AT and AB at the front. Hold the sides together in the front with a small rubber band while the cement dries. While the cement is drying install the remaining formers and cross pieces.
- Bend the landing gear as shown in the pattern on the plan. Now bend it as seen in the front view of the airplane. The landing gear is then cemented to the cross pieces in the location shown on the plan. For a stronger installation, the landing gear can be bound to the fuselage with thread. Use plenty of thread.
- Add the side formers AS through DS. Also install the stringers which are 1/16"x1/16" on the top and bottom and 1/16"x1/8" on the sides of the fuselage. The side stringers are notched so the side sheet covering piece F-7 fits flush with the stringers. They are also tapered toward the rear as seen in the top view on the plan. The area between BT and CT is covered with black bond paper. Now the sheet balsa covering parts F-1 through F-7 can be added, keeping the printing on the inside of the fuselage, otherwise it will show through the tissue covering. You will probably have to trim the sheet balsa covering parts to fit since all fuselages have slight variations in shape at this point. If there is a small gap between the sheets it can be filled with a sliver of balsa or a putty made of talcum powder and clear dope.
- After all parts are installed, go over all cement joints with a second coat of cement. When this is dry, sand the structure to eliminate all the rough edges and bumps. The comers of the fuselage toward the rear are rounded.

Completing The Landing Gear

Bend the axle as seen in the front view of the airplane. Solder it to the landing gear or bind them together with thread and use epoxy glue. Cement the landing gear fairings in place, sand them to a streamline shape, then cover with tissue paper. Cement the wheel pant parts together and sand to a streamline shape. Now install the wheel pants and wheels, using plenty of cement to join the pants to the landing gear fairing. Carve the side of the fillet next to the fuselage to match the contour of the fuselage. It's easiest to cut the slot for the landing gear first, then split it at one end so that you can slide it over the landing gear for trial fits. By "cut and try" carve and sand the fillets to a streamlined shape as seen in the photographs of the model. Do not permanently install them at this time. The tail wheel gear wire is bent as shown on the plans. It is cemented to a piece of 1/16" scrap balsa that is placed between the bottom fuselage longerons at the tail. Scale details of the tail landing gear are made of paper and thin wire.

Wings

Pin the leading edges, trailing edges, tip pieces and rear spar to the plans, cementing them together in the appropriate places. However, do not install the rear spar at the center section of the wing at this time. Now add ribs W1 through W8. When this is dry, partially cut through the leading and trailing edges at the tip dihedral break and block up the tips 1/4 inch after filling the dihedral break cuts with cement. Now install the front spar. Bevel the leading edge so that it continues the contour of the ribs. Partially cut through the leading and trailing edges at the center section dihedral breaks, fill the cuts with cement and block up the tips 3/4 inch. Now add the 1/16"x1/8" doubler at the front spar and the small 1/16"x1/16" pieces in the center section. When the cement is thoroughly dry, remove the wing from the plan and add the center section rear spar; note that it laps over the rear spars in the wing panels. Now cover the leading edge of the wing with 1/32" sheet balsa. Sand the rear of the trailing edge to a near point and the other parts of the wing to eliminate rough edges and to achieve a good airfoil shape.

Tail Surfaces

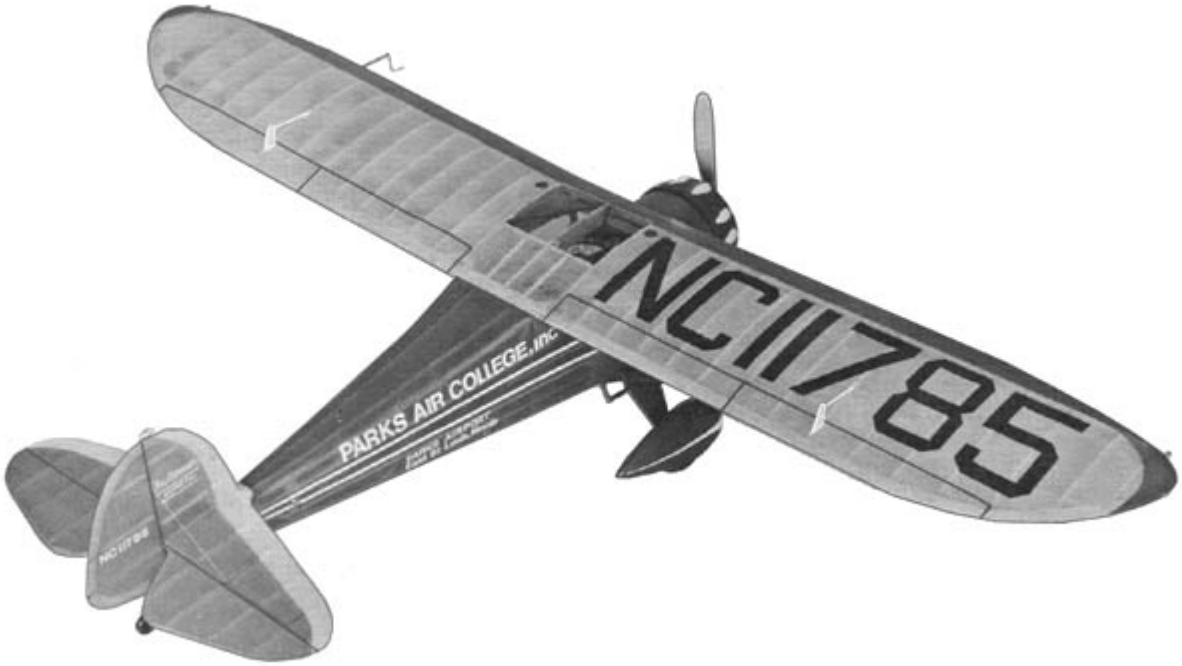
The tail surfaces are built directly on the plan in the same manner as the fuselage side. When the cement is dry, remove them from the plan and round the edges with sandpaper.

Cowl And Propeller

The cowl is made from a number of discs, C1 through C6, cemented together. Be sure that the square holes in the C3 pieces match. When the cement is dry, sand the cowl to a smooth shape. The nose plug is made in the same way.

Make a hole through the nose plug with a 1/16 inch drill, or by poking through a small nail. The propeller shaft bearings are made from washers (or eyelets) cemented at either end of the nose plug. Epoxy glue works best here. Finish the cowl and nose plug by applying several coats of sanding sealer, sanding between coats, until the wood grain is filled.

You can buy sanding sealer or make it by mixing about one teaspoon of talcum powder in one ounce of clear dope. When the grain is filled, paint both the cowl and the nose plug with red dope or paint for plastic. The inside front of the cowl is painted flat black. The cowl bumps are sanded to a streamlined shape, finished with sanding sealer, then painted white. After painting, they can be cemented to the cowl. Now add the propeller shaft and propeller. The nose plug is not cemented to the cowl since it is removable so the rubber motor can be changed.



Covering

In general, make the grain of the tissue run lengthwise on the piece being covered. The tissue paper will not make compound curves so in areas where there are compound curves like the front and middle of the fuselage you should cover with several small pieces of tissue. In order to get the proper color separation on the tail surfaces (red with white trim) join the red and white tissue together in the pattern shown on the plan, using clear dope. Then apply the tissue in the ordinary manner. Attach the tissue only to the outlines of the panel being covered. Use clear dope to attach the tissue to the structure. Don't use model cement to attach tissue. When the tissue has been applied to all the structure, spray it with a fine mist of water to tighten it. When the water is dry, give the tissue two coats of clear dope. The decals can now be applied referring to the plans and photographs for their exact location.

Decals

INSTRUCTIONS FOR DRY APPLICATION:
Cut the decal from the sheet with scissors or a sharp modeling knife. Trim close to the image, leaving about 1/32" to 1/16" of clear edge. Peel the backing sheet from about half of the decal because after it is in place it is very difficult to move. Once it is in place, press down on the edge and carefully work toward the half which does not have the backing sheet removed. Continue to peel off the backing sheet as you press the decal into place, being careful not to trap air under the decal. If an air bubble is trapped under the surface, puncture it with a pin and press the decal down on the surface. Rub with a soft, dry cloth to make certain it is sealed to the surface.

INSTRUCTIONS FOR WET APPLICATION:
Cut out the decals with a pair of sharp scissors. Leave about 1/32" to 1/16" of clear edge around the decal. Round the corners as you are cutting. Wet the surface on which the decal will be placed with soapy water (use dishwater detergent). Peel the decal film from the backing sheet. Place the decal on the model and squeegee the water from underneath with a balsa paddle. Allow to dry. This procedure will prevent air from being trapped underneath as is possible when the decals are applied dry. It also permits shifting it to exact position during application. Decals applied dry cannot be moved after they are pressed on.

Assembly

Add the side windows and skylight which are cut from clear plastic. Now cement the wing in place. Trial fit the paper windshield pattern and trim as necessary for perfect fit to the model. Cut out windshield and cement to model with Sig-Ment. Take your time with this job since a poorly installed windshield detracts a great deal from the appearance of a model.

The wing struts, tail struts and landing gear parts should be finished and painted in the same manner as the cowl. It is best to apply the white paint to the wheel pants before the red, as red is very difficult to cover with white. Check the wings for warps and remove any warps as shown in the flying instructions. Now add the wing struts which will tend to keep the warps from returning. The stabilizer and rudder can now be added; again check for warps and remove any. Now add the stabilizer struts and thread rigging. The other details such as steps, control horns, pitot tube, etc. can be added now or after test flying.

Contest Notes

The folding contest propeller shown on the plan was used for competition flying. This model has a good glide and should be powered so as to gain a lot of altitude. A left climb with a right glide was used. The altitude at the time the propeller folds is about 200 feet. The tensioner spring and stop should be adjusted so the rubber does not touch the bottom of the fuselage when it is unwound. For contest work, you must prove to the judges that your model is an accurate scale replica of a real airplane. This normally takes the form of a three-view drawing and photographs of the real airplane. The photo in these instructions will be adequate proof of the markings of the real airplane. Sources of additional proof of scale are:

1. "Of Monocoupes and Men" by John W. Underwood, Heritage Press, Box 167, Glendale, CA, 91209. Contains the his tory of all Monocoupe types and many photos.
2. "The Lightplane" by John Underwood and George Collinge, Heritage Press, Box 167, Glendale, CA, 91209. Contains some photographs and a 3-view on page 64.

Modifications

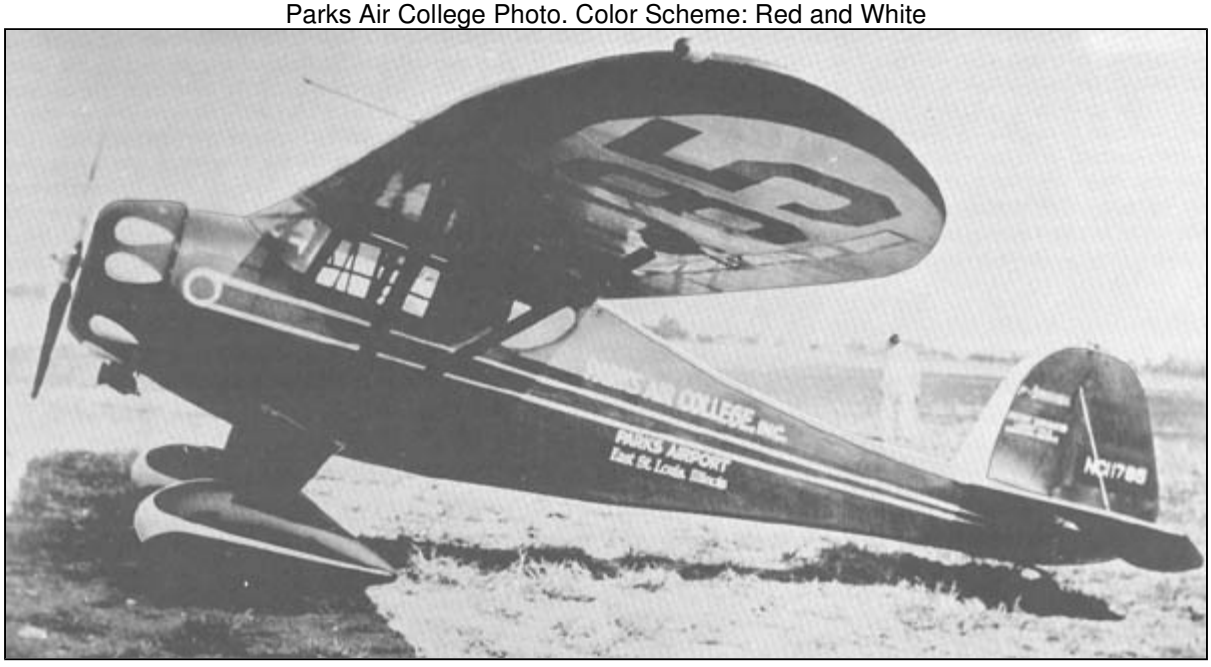
A very successful indoor version of the Monocoupe has been made. Slightly smaller wood sizes to keep the weight down were used as follows:

Main fuselage structure	1/16" x 1/16"
Stringers	1/32" x 1/16" and 1/32" x 1/8"
Tail ribs and spars	1/32" x 1/16"
Wing trailing edge	1/16" x 3/16"
Wing tip parts WT1 thru WT3	1/16 sheet

A folding propeller is unnecessary on an indoor model. Power should be one loop of 3/16" or 1/4" Sig contest rubber, 30 inches long, depending upon the ceiling height.

The Monocoupe is an ideal size for the Brown CO2 motor. Cowl former C4 should be made of 1/16" plywood and the motor mounted on it with very small wood screws.

Parks Air College Photo. Color Scheme: Red and White



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.

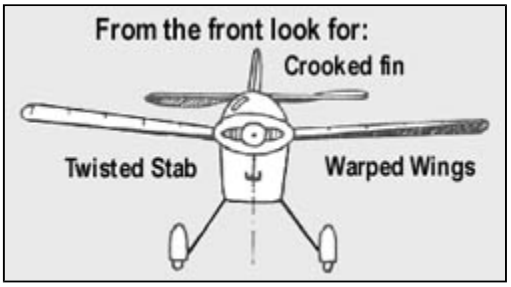
Testing And Adjusting

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.

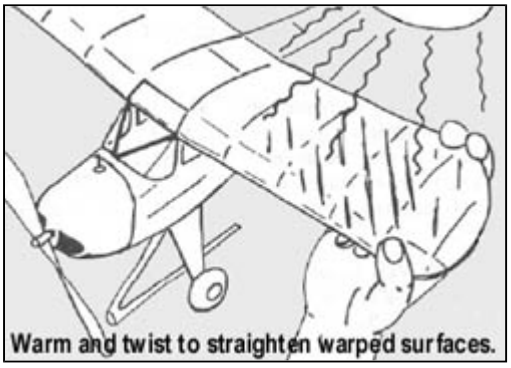
Every model is a little different and needs its own special set of adjustments. Contest winning flyers make dozens, even hundreds, of test flights "trimming" a model for best performance. So don't give up if your first flights aren't perfect.

Preflight Preparations

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



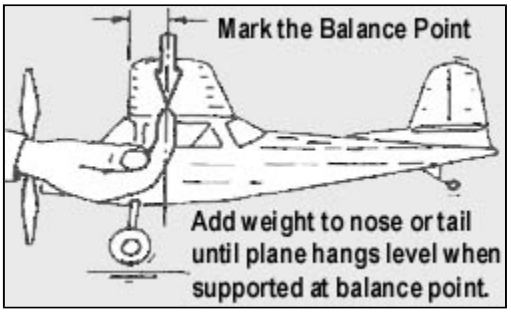
Looking from the front of the model, check that the bottom of the wing and tail surfaces are flat - not twisted. Sight down the center line of the fuselage as shown in the drawing. Right and left wing should look alike; you shouldn't see the top of one wing and the bottom of the other. The fin should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

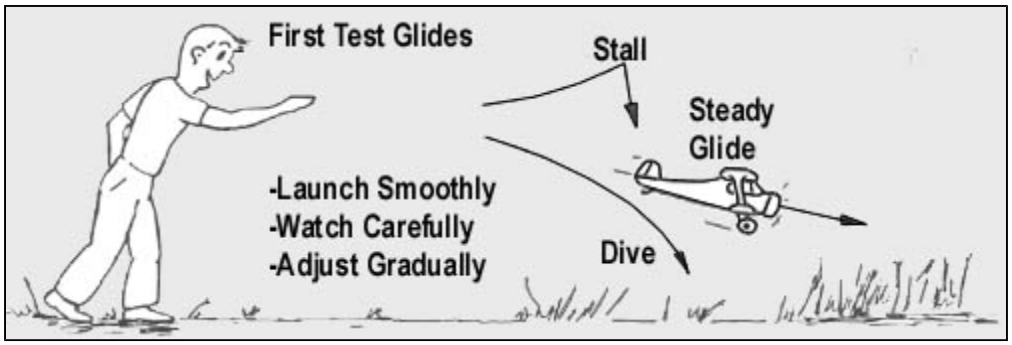
Modeling clay makes handy balancing weight - it can be pressed permanently in any corner. Wire solder or BB shot can be used by cementing in place.



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.

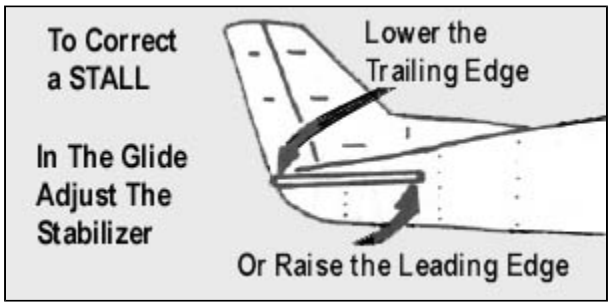


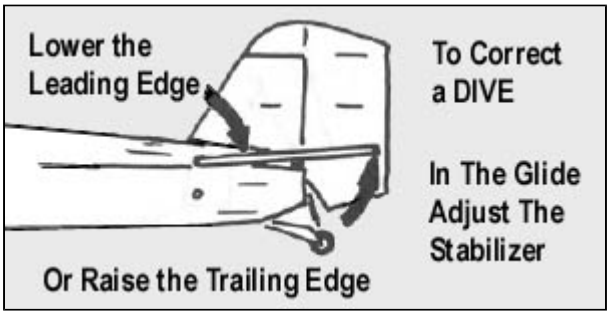
Begin by gliding the model from your hand into a patch of tall grass. Grasp the ship by the fuselage near the balance point, and aim the nose at a spot on the ground about twenty feet in front of you. Launch the ship forward about the way you would a paper dart airplane, nose down.

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.





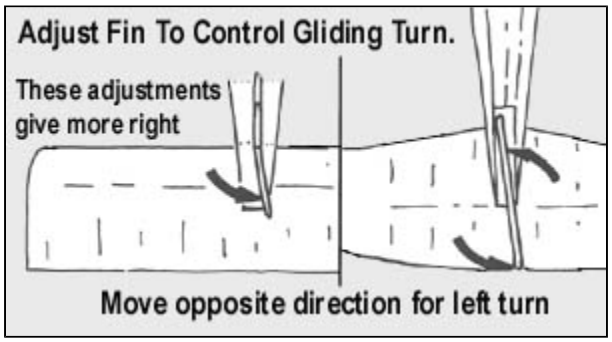
Diving

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.



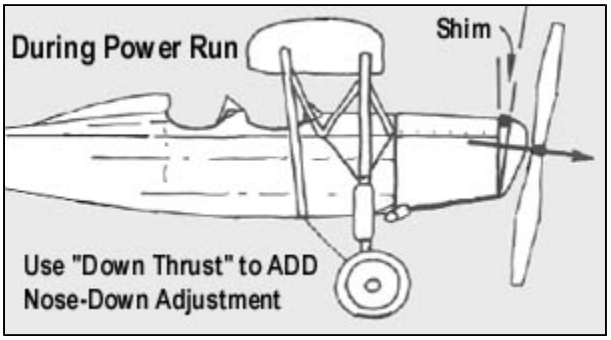
Small changes in fin setting can be made by bending the surface. But if more than 1/32" or so of change is required, cut the fin loose and re-cement it at the desired angle. When the glide is smooth and steady, you are ready to go on to powered tests.

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.

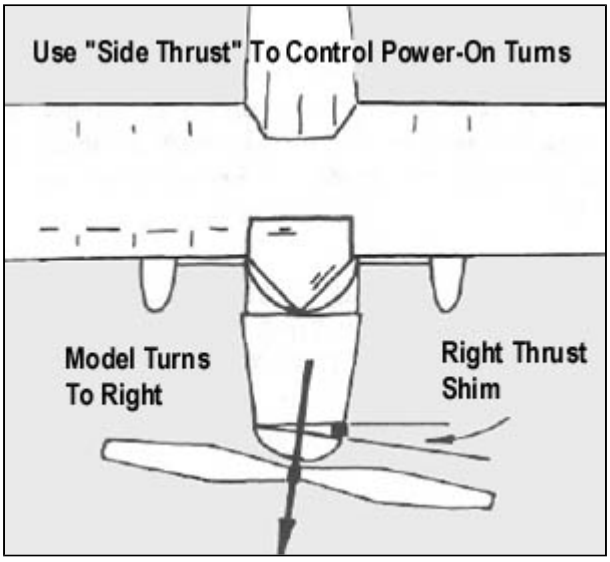
If your ship tries to climb, but loses speed and stalls, point the propeller downward by slipping a scrap of 1/32" balsa or a paper book match between the top of the noseblock and the front of the fuselage. The wedge is called a "shim" and the adjustment is called "downthrust". Downthrust is illustrated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

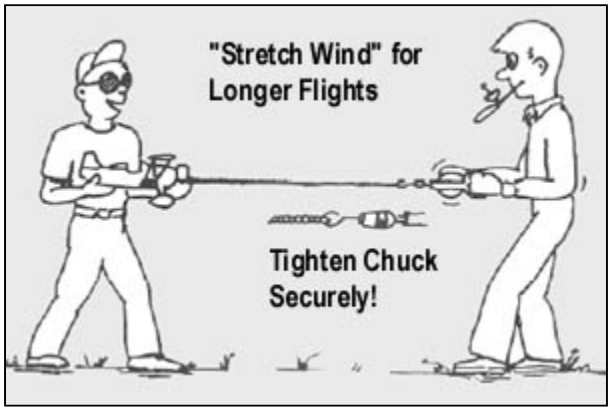
When your Classic has been adjusted according to instructions, it should have no trouble taking off by itself from a smooth surface. No adjustment changes should be necessary. You may find that take-offs are better if you release the ship pointed at a slight angle to the wind instead of headed straight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

SIG MFG. CO., INC. **401-7 South Front Street** **Montezuma, IA 50171-0520**	SIG MODELER S ORDERLINE: (to order parts)	1-800-247-5008
	SIG MODELER S HOTLINE (for technical support)	1-641-623-0215
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