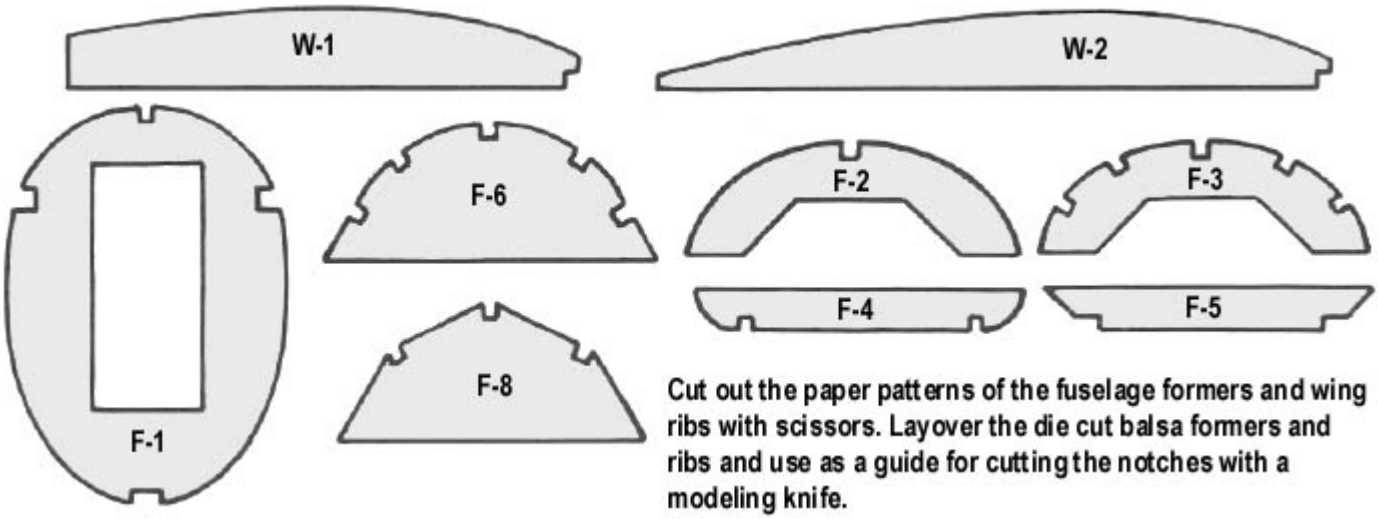
The '29er

SIG SIGFF21 CLASSIC SERIES

BUILDING AND FLYING INSTRUCTIONS

General Notes

Follow the plans carefully. Study the written instructions as you build. Even unusual jobs like mounting the 2ger's parasol wing are not difficult when each step is done carefully and in the right order.
Plastic kitchen wrap stretched over the plans will prevent assemblies from sticking to the paper.
Either white glue like Sig-Bond, or regular model airplane cement, like Sig-Ment, can be used for wood and Krome Kote cardboard joints.
Cement sandpaper to a small flat block. Don't use it loose in your hand like a wash cloth.



Cut out the paper patterns of the fuselage formers and wing ribs with scissors. Layover the die cut balsa formers and ribs and use as a guide for cutting the notches with a modeling knife.

MAIN CONSTRUCTION

Tail Surfaces

Build the tail surfaces directly over the plans. Accurate joints will reduce warping problems when the tail is covered.

Fuselage

- Make two fuselage side frames, one on top of the other, over the plans. All side frame parts are 3/32" square and are shown shaded on the plans.
- Mark the location of L4, F9, and the 1/16" square cowling side stringers on the frames. DON'T cement the two 3/32" square upright pieces at the rear of the cowling together. (These are the pieces which will have the cardboard hinges glued to them). They are cemented to the top and bottom longerons only.
- After separating the two side frames with a thin razor blade, cement the cardboard hinges and L4s on the inside of each frame as shown.
- Pin the two fuselage side frames upside down on the fuselage top view. Join the sides by cementing 3/32" square balsa cross pieces in place.
- Cut the fuselage longerons between F2/F3, and F4/ F5, bend the frames inward (on the hinges) and cement F1 in place. Then coat the four cut places with cement. When dry, the remaining formers, F2 to F9, and stringers can be added. F2 and F3 are cemented together for strength. F4 and F5 are cemented together and the top edge is beveled for a good fit.
- Don't forget the extra pieces shown on the plans to hold the landing gear assembly in place. Notice that there is no cross piece near F2/F4.
- Read the Cowling Notes on the plans before covering the nose. The cardboard cockpit and cowling pieces can be pre-curved by pressing and rolling a round pencil on the inside of the part while it is lying on a spongy surface like a carpet or a rubber pad. Trim the cowling covers to fit and cement in place, bottom cover first. Don't attach the cockpit cover until after the fuselage is tissue covered.
- The noseblock assembly is just plugged into F1, not permanently cemented. Glue thin strips of the cardboard in the kit to the edges of the rectangular plug if required for a snug fit.

Wing

- Pin the cardboard wing hinges in place on the plans and then build the entire wing flat on the bench. Notch the two 1/16"x1/8" pieces to receive the "N" strut tabs at the same time to be sure they are identical. Follow the Dihedral Notes on the plan while building the center section.
- When the flat wing panels are dry, leave one panel pinned to the bench, loosen the other panel from the plans, and gently raise the tip, bending at the hinges. Don't force it.
- If the wing doesn't bend easily, locate the binding spot and trim away a little wood or cement to give the required clearance.
- Slide the cardboard dihedral jig to the position shown on the plan and pin it in place. The wing should rest easily in position without twisting or bending. Put a small drop of white glue at the point where the leading edges meet and where the W3s meet. Don't fill the whole crock with glue.
- Allow to dry thoroughly and then cement the cardboard capstrip over the crack between the W1 ribs. Cement well at the leading and trailing edges.
- After removing the wing from the plans, trim off the overhanging ends of the capstrip. The wing hinges may be removed for smoother covering.
- Use the dihedral jig to mark the BALANCE POINT and lift strut locations on the 1/16"x1/8" rib reinforcements.
- Don't cover the wing until you have made the N strut Fit Check.

N Strut Assemblies

- Carefully cement 1/16"x1/8" strips right to the cardboard N strut patterns. Cut balsa pieces to the exact length shown. Don't slip and cut off the paper tabs. Remove all excess glue before it dries. Cut the assemblies out of the sheet with a sharp blade after the joints are completely dry.
- The small arrow on one tob marks the top/front/outside of each N.

N Strut Fit Check

- While fuselage and wing are still uncovered, check that the N struts are exactly the same (except one Right and one Left), and that the tabs slide easily into the wing slots. Enlarge the slots if necessary.
- Now cement only the tabs on the inside of the fuselage as shown. Don't cement the balsa struts rigidly to the longerons yet. Be sure that both Ns will bend outward at the top enough to mate with wing slots without forcing.
- Only when you are sure that the wing, fuselage and N struts are going to fit together correctly should you go ahead and cover the wing and fuselage.

Covering

Use full strength dope to attach tissue to frameworks. Since the 29er is not an exact scale model, you can decorate it any way you like.

Wing and tail are covered on both sides. It's best not to shrink or dope these surfaces. The fuselage covering may be shrunk with a light water spray and given a coat or two of thinned Sig Lite-Coat Dope, if desired. Covering all solid wood parts like the noseblock and struts with tissue makes a very neat looking model.

Assembly

Never try to cement anything to wood that is covered with tissue. The joint will be weak, and when it breaks, it will tear on ugly hole in the covering. Using a sharp blade, lightly cut around the area where the attachment is to be made, then peel the patch of paper off, exposing bore wood. A drop of acetone will help loosen the paper patch.

- Cement the stabilizer and then the fin in place with small spots of cement.
- Be sure the 1/16"x1/8"x1/8" INCIDENCE BLOCK is in place under the stabilizer.
- Complete the cockpit and windshield area before attaching the wing.
- Hold the fuselage firmly in place on the workbench with any small, handy weights and then set the wing in place on the projecting N strut tabs. Use some books or other convenient objects to hold the wing in good alignment with the fuselage and tail. Then, without jarring your set-up, lift the wing out of the way and put small drops of cement (preferably white glue) at the top and bottom of each N strut - eight places altogether. Then set the wing carefully bock in place. Allow to dry thoroughly.
- Your ship can now be picked up to allow the four lift struts to be cut to fit and glued in place. If you have worked carefully, your wing is flat and true. Don't force it out of shape with carelessly fitted struts. Take your time.
- Tie ends of rubber strand with a square knot. Wet the knot with water before pulling it tight. Hook the rubber band over the prop shaft, drop the rubber into the fuselage, and slide the dowel through the loop at the rear end.
- Slide propeller shaft through noseblock, bead, and propeller, with rounded boss of propeller next to bead. Bend over projecting end of the shaft as sharply as possible.

The 29er flies best when adjusted to circle to the right in both climb and glide.

29ers are easy to adjust and have made flights of nearly a minute. Good luck!

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.

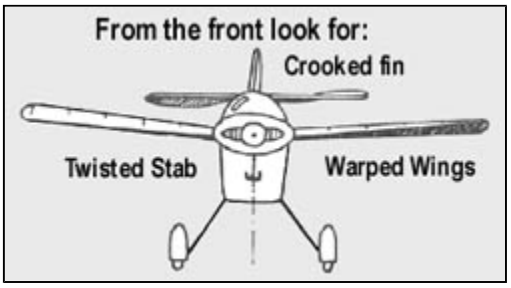
Testing And Adjusting

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.

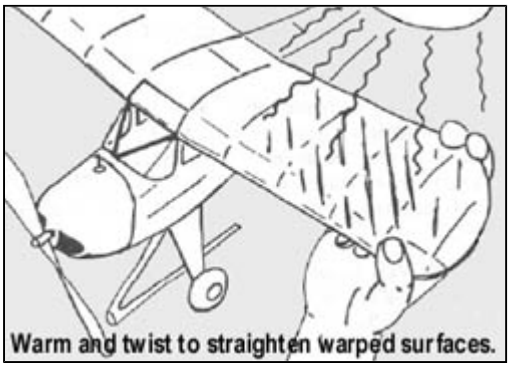
Every model is a little different and needs its own special set of adjustments. Contest winning flyers make dozens, even hundreds, of test flights "trimming" a model for best performance. So don't give up if your first flights aren't perfect.

Preflight Preparations

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



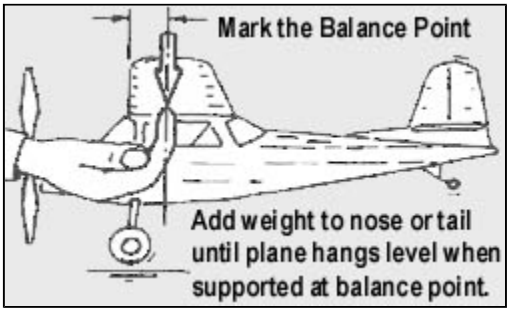
Looking from the front of the model, check that the bottom of the wing and tail surfaces are flat - not twisted. Sight down the center line of the fuselage as shown in the drawing. Right and left wing should look alike; you shouldn't see the top of one wing and the bottom of the other. The fin should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

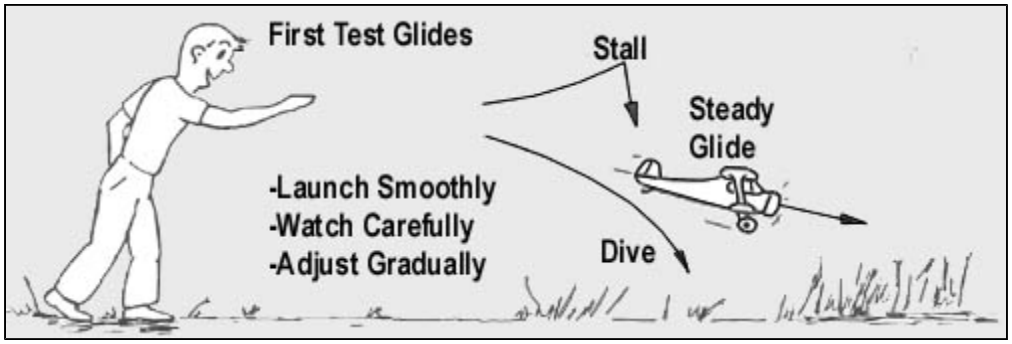
Modeling clay makes handy balancing weight - it can be pressed permanently in any corner. Wire solder or BB shot can be used by cementing in place.



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.

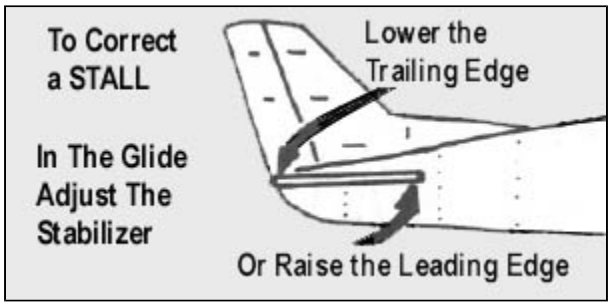


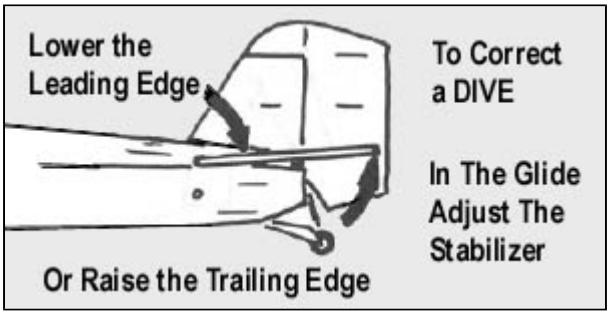
Begin by gliding the model from your hand into a patch of tall grass. Grasp the ship by the fuselage near the balance point, and aim the nose at a spot on the ground about twenty feet in front of you. Launch the ship forward about the way you would a paper dart airplane, nose down.

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.





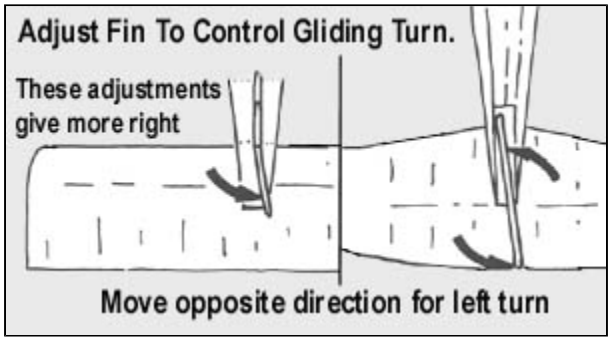
Diving

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.



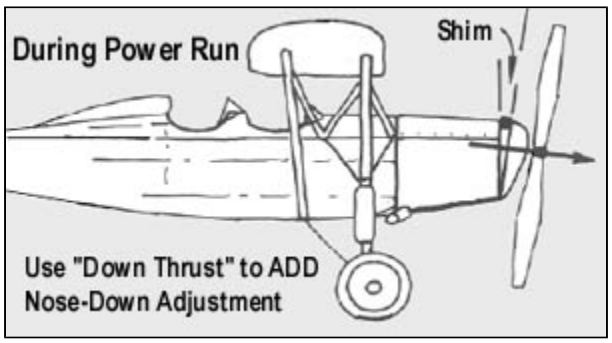
Small changes in fin setting can be made by bending the surface. But if more than 1/32" or so of change is required, cut the fin loose and re-cement it at the desired angle. When the glide is smooth and steady, you are ready to go on to powered tests.

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.

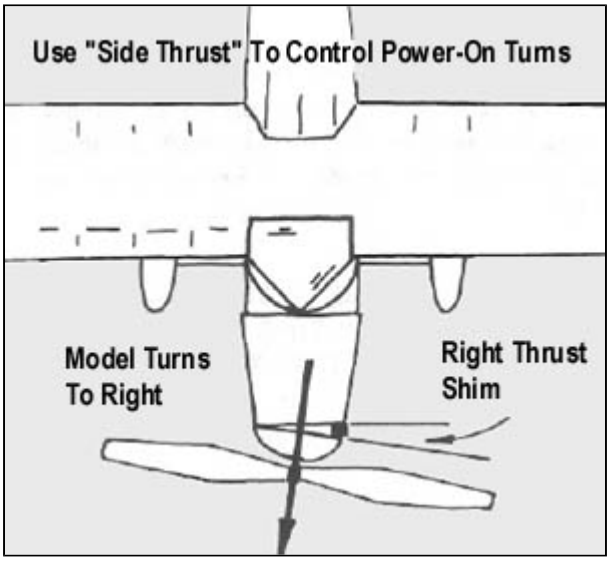
If your ship tries to climb, but loses speed and stalls, point the propeller downward by slipping a scrap of 1/32" balsa or a paper book match between the top of the noseblock and the front of the fuselage. The wedge is called a "shim" and the adjustment is called "downthrust". Downthrust is illustrated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

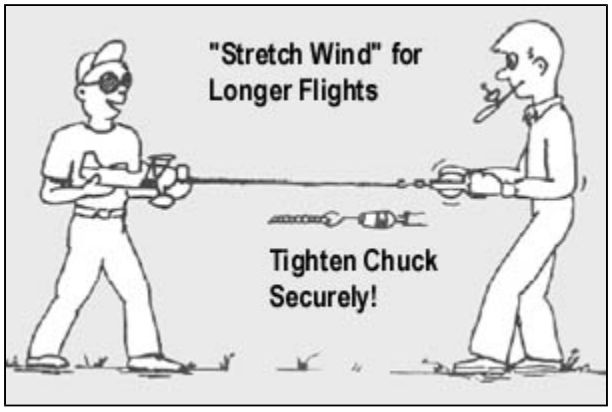
When your Classic has been adjusted according to instructions, it should have no trouble taking off by itself from a smooth surface. No adjustment changes should be necessary. You may find that take-offs are better if you release the ship pointed at a slight angle to the wind instead of headed straight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

The licence numbers are cut from tissue. Tape tissue to a cardboard backing sheet. Tape the paper pattern on top of the tissue. Cut out numbers with a sharp razor knife and straight edge. Fasten with dope.

NC1929

SIG MFG. CO., INC. is totally committed to your success in both assembling and flying the `29er. 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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