Sky Squire Compacts

New versions of the popular Sky Squire offer 049-engined GG and rudder-only flying, and a size for 15's and small digitals.

R. JESS KRIESER

I have always been interested in the smaller-sized R/C ships, as they are much easier to transport in a car, build faster, and have lower inertia loads which enable them to take more pounding around from the goofs of pilot error without fatal damage to the structure. However, there was little in reliable lightweight, compact control equipment to give rudder, elevator, and motor control for a small ship until Herb Abrams came along with a simple, reliable Galloping Ghost actuator which did away with the complicated "bird cage" at the tail-end that always seemed to be a source of constant trouble. Later, the Dual-Pak system with twin actuators operated from a decoder offered even smoother, more reliable control of rudder, elevator, and throttle.

When these systems came along several years ago, it seemed natural to me to scale down the Sky Squire to fit these systems. I started out with the ½-A ship, for 049 to 09 size engines. By this time I had become somewhat of a convert to digital proportional, and I wanted another small edition of the Sky Squire with just enough room in it to pack in three channels of a digital system, so the Junior size version was born. This one offered more than enough room for the Galloping Ghost or Dual-Pak systems.

At the time these ships were developed, I had no idea that full-house digital systems would soon be reduced in size to 10- to 15-ounce systems. But since they have, both of these ships are right in the mainstream of the trend, and are ideal for the new compact digital systems, as well as GG and Dual-Pak systems. The new Controlaire system with 225 mah power pack and S-4 servos is ideal for either of these, and with a little extra work on the part of the builder, you can even go to ailerons on either of these ships.

However, it has been with the GG and Dual-Pak systems that these two ships have really proved themselves to date. A number have been built, with excellent flight reports. All flight characteristics that have made the big Sky Squire (now kitted by Midwest) so popular have been preserved. I designed this ship during my beginning days in R/C to satisfy my desire for a "lazy man's airplane," that would be tame enough to learn to fly on, yet rugged enough to survive the inevitable beating that a trainer must take. The Sky Squire fulfilled all my desires to the utmost, giving me a highly maneuverable, responsive airplane, yet tame enough and stable enough that when one got into trouble, you could simply throttle back and rely on the inherent stability of the ship to get you back on the right track. It has proved so stable that the original Sky Squire was landed on a number of occasions with the transmitter turned off!

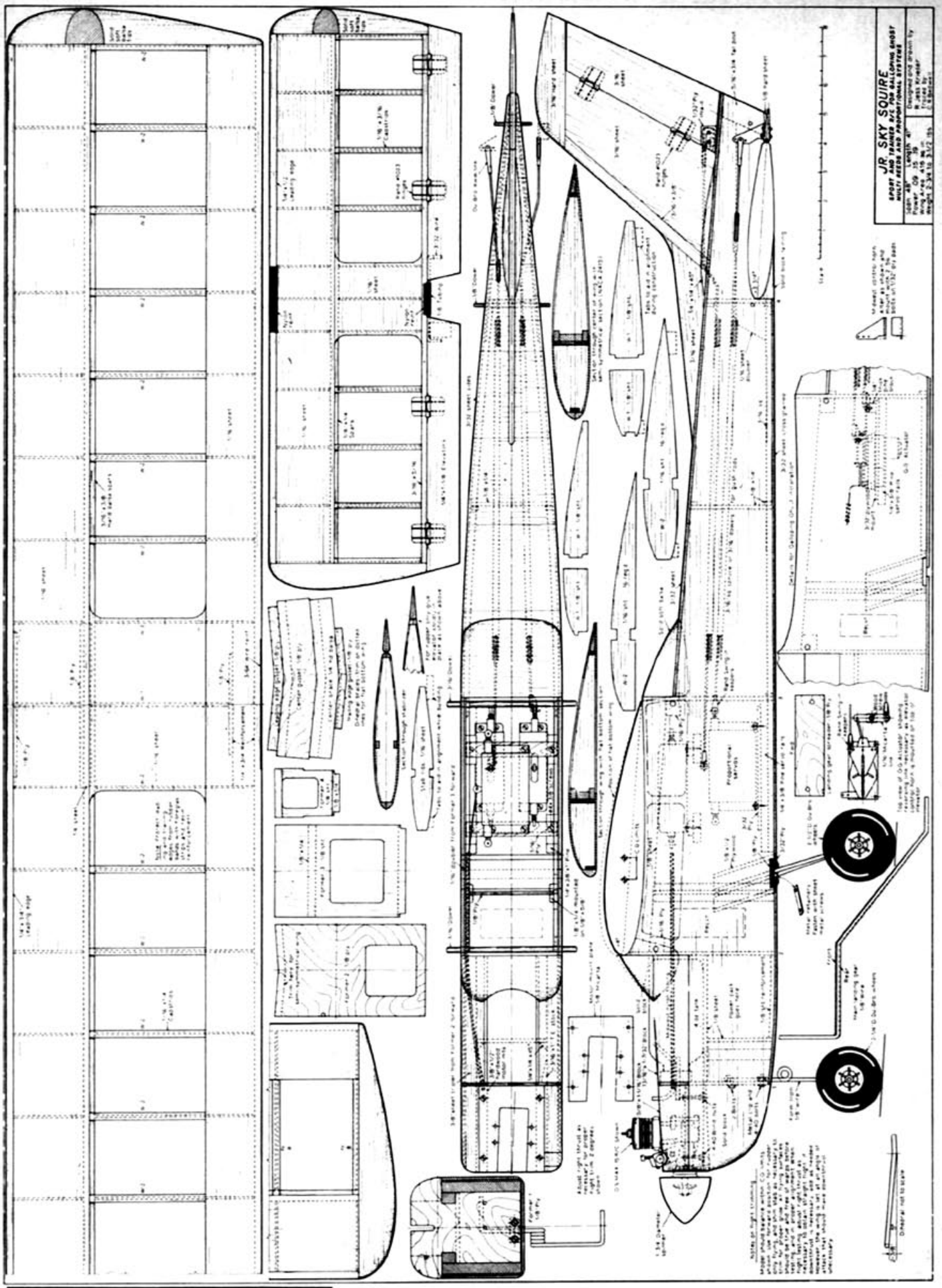
I flew the big Sky Squire for several years, going through four of them before working out the compact versions presented here. However, I never got to fly either the Junior or ½-A prototypes that I built, as Herb Abrams traded me out of them almost before the dope had dried!

It was Herb that really proved their performance with the GG and Dual-Pak systems. He came over one weekend with the ½-A ship that I had built, and shocked me with what he had done to it. He had stuck a Dual-Pak system in it, with an Enya 09 in the nose, bringing the all-up weight to over 2 lbs., which was about ½ lb. more than I thought practical for a ship with only 269 square inches of wing area. To make matters worse, the wind at our local flying field was so strong and gusty, that flyers with the 60-powered Taurus were staying on the ground.

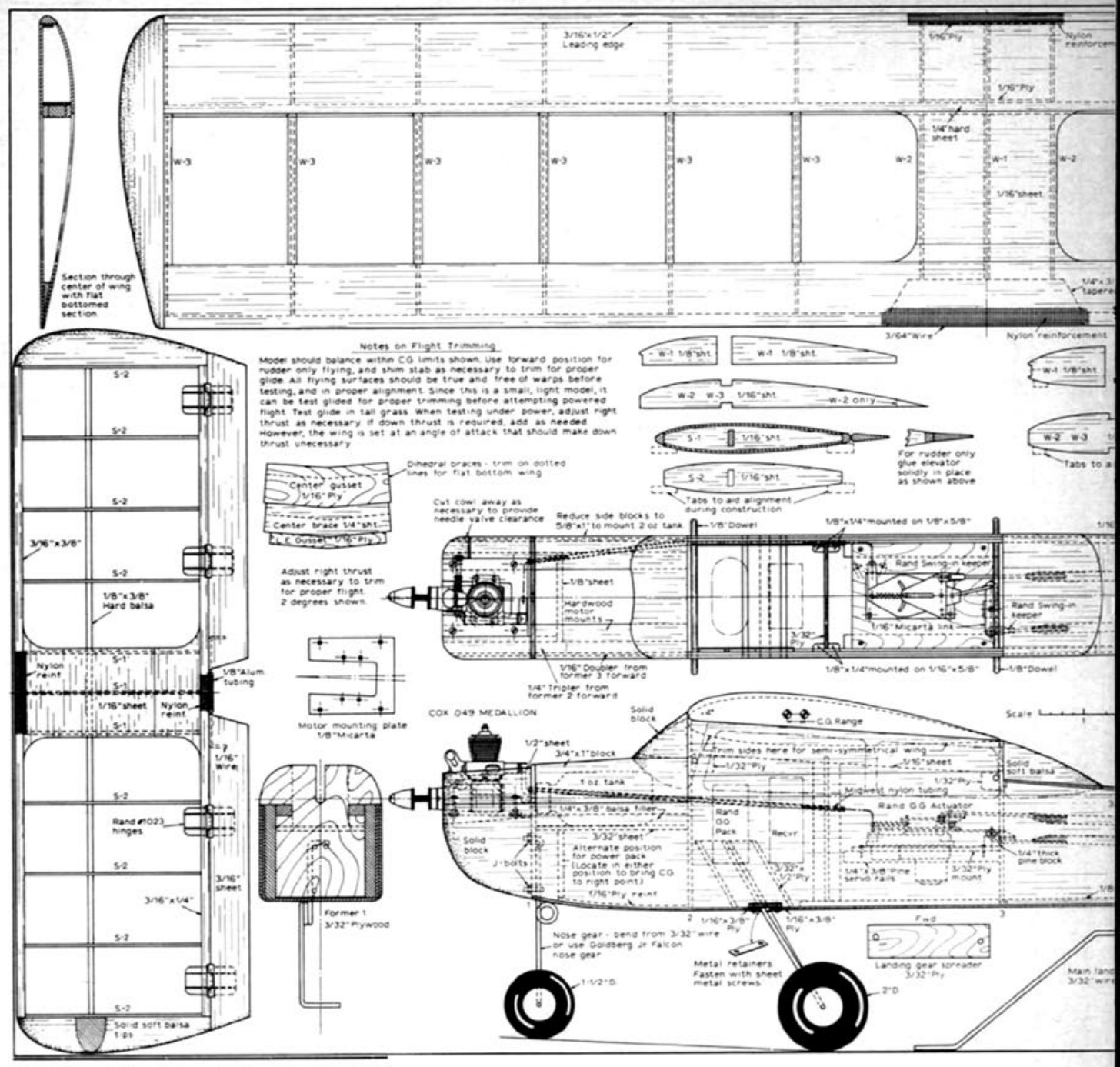
But not Herb! He came over to fly. He fueled up, started the engine, checked the system, and handed the ship to me to hand-launch. I tossed it, and up it went. Then he proceeded to stunt it all over the sky, like a big, hot competition ship, and like there was no wind. Next, he rolled it inverted and flew all around the field upside down. A couple of more flights with a repeat performance on each showed it was no fluke, and that the ship had power handling and penetration characteristics beyond what I had anticipated. At this point he turned over the transmitter to me, and I was quite pleasantly surprised to find that it seemed as smooth as the big one on Digital proportional, but with slightly faster response because of its smaller size.

When Herb went back home he took the finished Junior size ship with him, and phoned me a short time later to report on the flight results. He liked this one even better than the ½-A ship. He particularly emphasized the fact that it was the first design that he has flown with his systems that is able to make rudder turns without correcting constantly with elevator to keep the nose from dropping. This was a characteristic that I found in the big ship, and when properly trimmed, it will make gentle rudder turns, even close to the ground without having to camp on the up elevator control to keep the ship in the glide slope. Herb also stated that this is the first ship that he's found which he feels he can use to teach his wife to fly without worrying about her getting rattled and nervous on the transmitter. Right now, the original Junior-size ship is being flown by Jim Northmore, on "loan" from Herb Abrams.

You can build either of these designs with your choice of a flat-bottomed or semi-symmetrical wing. Performance is similar with either wing, except that the flat-bottomed version will glide a bit slower, and is a bit gentler to handle on landing approaches. However, it won't do outside loops or inverted flight very well because of the abrupt change in lift coefficients resulting when a flat-bottomed section is turned into an inverted position. When flying with Galloping Ghost systems, the semi-symmetrical wing version is smoother to fly, as it does a better job of damping out the slight up and down movements that result from the "galloping" control surfaces. The flat bottom section produces larger changes in lift coefficients when the angle of attack is varied slightly, hence, tends to be more sensitive to the galloping effect of the control surfaces. This is not a characteristic of this particular design, but simply an aerodynamic fact of life, and is true with any Galloping Ghost ship utilizing a flat-bottomed section. Whichever wing you choose, you'll find this to be a real rewarding "fun" airplane to build and fly.



FULL SIZE PLANS AVAILABLE — SEE PAGE 60



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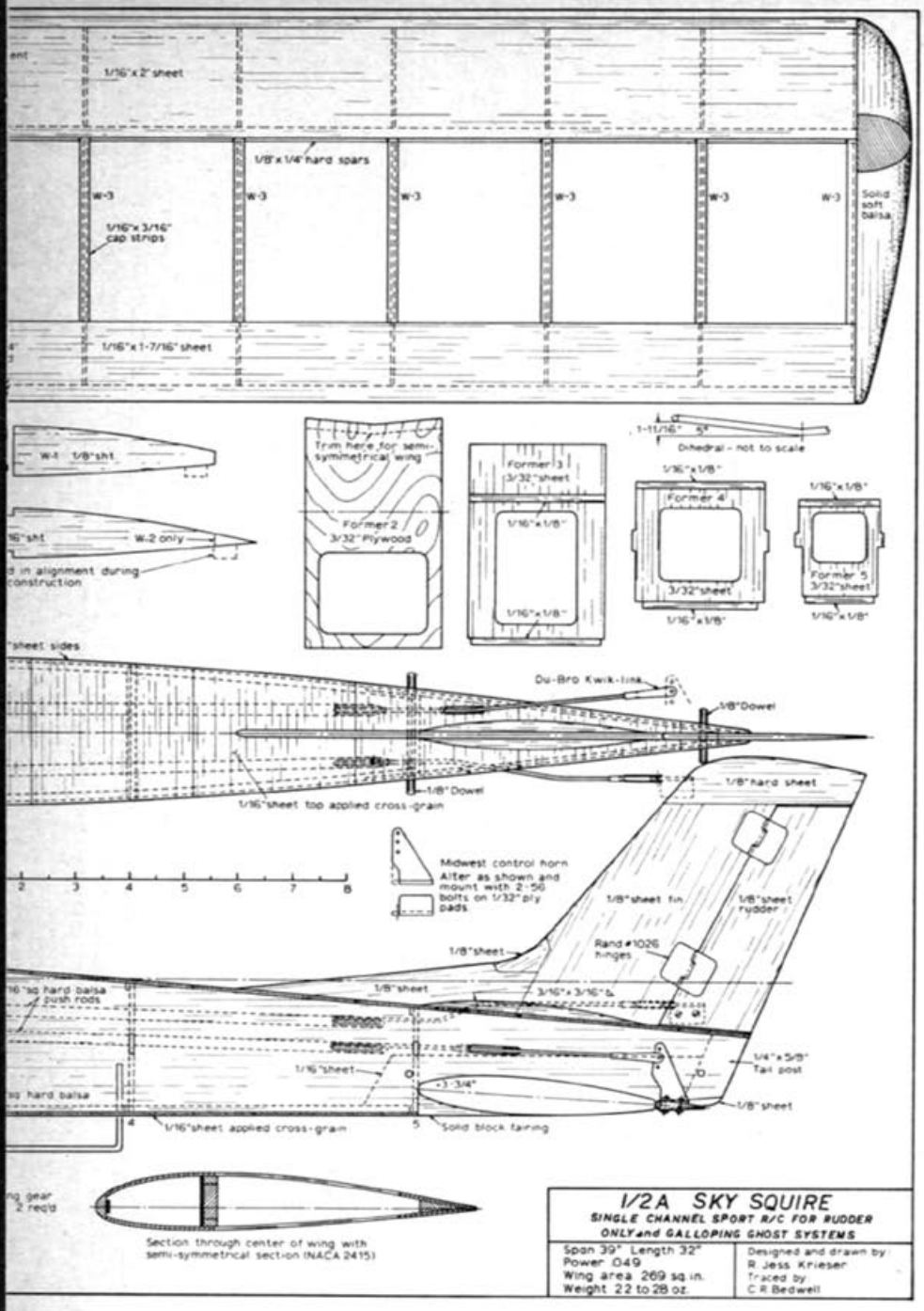

1/2A SKY SQUIRE

SINGLE CHANNEL SPORT R/C FOR RUDDER ONLY and GALLOPING GHOST SYSTEMS

Span 39" Length 32"	Designed and drawn by R. Jess Krieser
Power .049	Traced by C. R. Bedwell
Wing area 269 sq. in.	
Weight 2.2 to 2.8 oz.	

Construction of both ships is very nearly identical, so the following instructions will apply to both. The only significant difference between the two ships is in the sizes of balsa used.

Wing: You can build either a flat-bottomed wing, or semi-symmetrical wing; ribs are shown for both. Tabs are shown on the semi-symmetrical section to aid in building on a flat board. You may either build the wing in two sections, joining it at final asembly and adding the plywood dihedral braces, or you can build it in one piece. If doing the latter, join two flat boards, blocking up the ends to form the proper dihedral angle shown on plans.

If building the flat-bottomed wing, start by cutting the leading edges and bottom sheeting to proper length and proper dihedral angles. Lay down the leading edge, then the leading edge sheeting, butt-gluing it to the leading edge. Next, lay down the bottom trailing edge sheeting, and bottom center-section sheeting, then glue the cap strips in position. Glue the spars in place on top of the sheeting, then install all ribs. Add the center-section spar filler, trailing edge reinforcements at center-section, and leading edge dihedral brace. Then install the top spars and the plywood dihedral brace, and you are ready to install all top sheeting and the cap strips. All that remains is to add the tip blocks after the assembly is dry and you have removed it from the building board. Final step is to carve and sand to final shape, and add the reinforcement to the center-section to prevent cutting into the wing by the hold-down rubber bands.

If building the semi-symmetrical wing, the procedure is slightly different, begin by laying down the lower spars, and glue all ribs in position. Next, add the leading edge and leading edge dihedral brace. This is followed by the center-section spar filler, top spars, and plywood dihedral brace. Then install the top sheeting at both the leading and trailing edges, add cap strips and center-section sheeting. When dry, remove from board, trim off the tabs on the bottom of the ribs, and install the leading edge sheeting on the bottom. While this is drying, install the trailing edge filler at the center-section, the trailing edge sheeting, bottom center-section sheeting, and cap strips. Complete by adding tip blocks, then carve and sand wing to final shape.

Stab: Ribs are cut with tabs to facilitate building on a flat board. Pin bottom spar in position, then glue all ribs in place. Add top spar, leading edge, and trailing edge spar. Next add sheeting and cap strips. When dry, remove from board, trim off tabs, and add bottom sheeting, cap strips, and tip blocks. Carve and sand to final shape. Cut and sand elevators to shape and hinge them after covering is completed.

Fuselage: Cut sides to shape from sheet balsa, and reinforce with doublers from former 3 forward. Add bottom longerons and stab-opening doubler. Add triplers extending from former 2 forward, and install plywood landing gear parts to inside of each fuselage side. While sides are drying, cut all formers to shape, using balsa or plywood as specified. Install hardwood engine bearers on fuselage sides before assembling, lining them up with the slots in the firewall. To assemble sides, pin in position over plans and glue formers 2 and 3 in place, squaring up as you do so. Since the bottom of the fuselage is a straight line from former 2 rearward, this simplifies alignment, as the whole assembly can be kept pinned in place over the plans. Shape the tail post, and install it, along with the remaining formers. While the assembly is still pinned down, add the top sheeting which will help lock the assembly into proper alignment.

After removing from board, install the plywood landing gear pieces on the bottom, and the pine servo mounting rails. Bending the main landing gear units at this time will enable you to use them to help in proper alignment of the bottom plywood landing gear mounting pieces. Next step is to sheet the bottom from the landing gear mount rearward.

Box off the fuel tank compartment with sheet balsa beneath the engine bearers, then reinforce the firewall mounting with pieces of trailing edge stock. Install the

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Squires are good trainers. The flat-bottom wing has lots of lift — especially when using three-servo control systems.

Semi-symmetrical wing best for Galloping Ghost as elevator pulses are smoothed out. This wing also is best for sport-stunting.

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nose gear, adding a steerable nose gear of your choice if you prefer. It would be best to eliminate the steerable nose wheel on the ½-A size model because of the extra weight involved in a model this small. Install tubing for throttle pushrod, and box off the battery pack area under the fuel tank compartment.

After installation of the nose gear, cut and glue the lower nose block in place, installing blind mounting nuts in the motor bearers before you do so. Add the remaining bottom sheeting. Cut and glue the balsa blocks in place that form the sides of the tank compartment and the rest of the nose. Then cut and glue the blocks in place that form the windshield and the cabin fairing aft of the wing. Add the wing saddle pieces to the wing opening, along with the plywood gussets to reinforce dowel mountings. Carve and sand the nose and windshield blocks to final shape, then sand the entire fuselage to finished shape, rounding all corners as you do so.

Fin and rudder are simple, but be sure to use hard sheet for the top portion of the fin to give added protection for nose-overs. Glue the fin and dorsal assembly in position on the top of the fuselage, lining it up very carefully to make sure it is on dead center. Fuel proofing the engine and tank area with a couple of coats of fiberglass resin completes the fuselage.

Covering and finishing: You can keep the final weight down by covering with colored silk, as I did on the prototypes, using colored dope only for the trim. After fine sanding the entire ship with 400 paper, apply a coat of clear dope with talcum powder added. Sand, then follow with a coat of untreated clear dope. Sand lightly, and apply silk to entire ship. After silking, give the entire ship six to eight coats of thinned-out clear dope. Mask off trim and window areas, and apply colored dope to these areas. After this has dried and masking tape has been removed, add wing and stab hold-down dowels, and paint with colored dope to match the rest of the ship. Then spray two thinned-out coats of clear Aero-Gloss on the entire ship. This helps level out the sheen of the dope, giving it a uniform gloss, levels the edges caused by the masking tape, and adds additional fuel-proof qualities to the final finish. Now, all that is left is to install engine, landing gear, wheels, tank, and radio gear.

Test flying: Check for proper position of the CG, and to see that all surfaces are true, with no warps, and properly aligned. If any warps, steam out before flying. Check to see that decalage is as specified on the plans. If all checks out O.K., only a few test hops will be needed for final trim. Try to achieve smooth, flat glide approaches at idle power with elevator at zero trim. Ship should climb well under full power without hanging on the prop. If it tends to hang, increase the down thrust. If ship tends to go to left or right under power and in glide, trim rudder. If it does this only under power, but glides straight, adjust side-thrust as necessary. This is about all the trimming you'll need to do before you're ready to settle down to some real fun-flying with your compact Sky Squire, in whichever size you have selected.