PELIBAN.. the Happy Bipe

Jack Headley

An easy-to-build, pleasant flier for either one or two channels and 1/2A power.

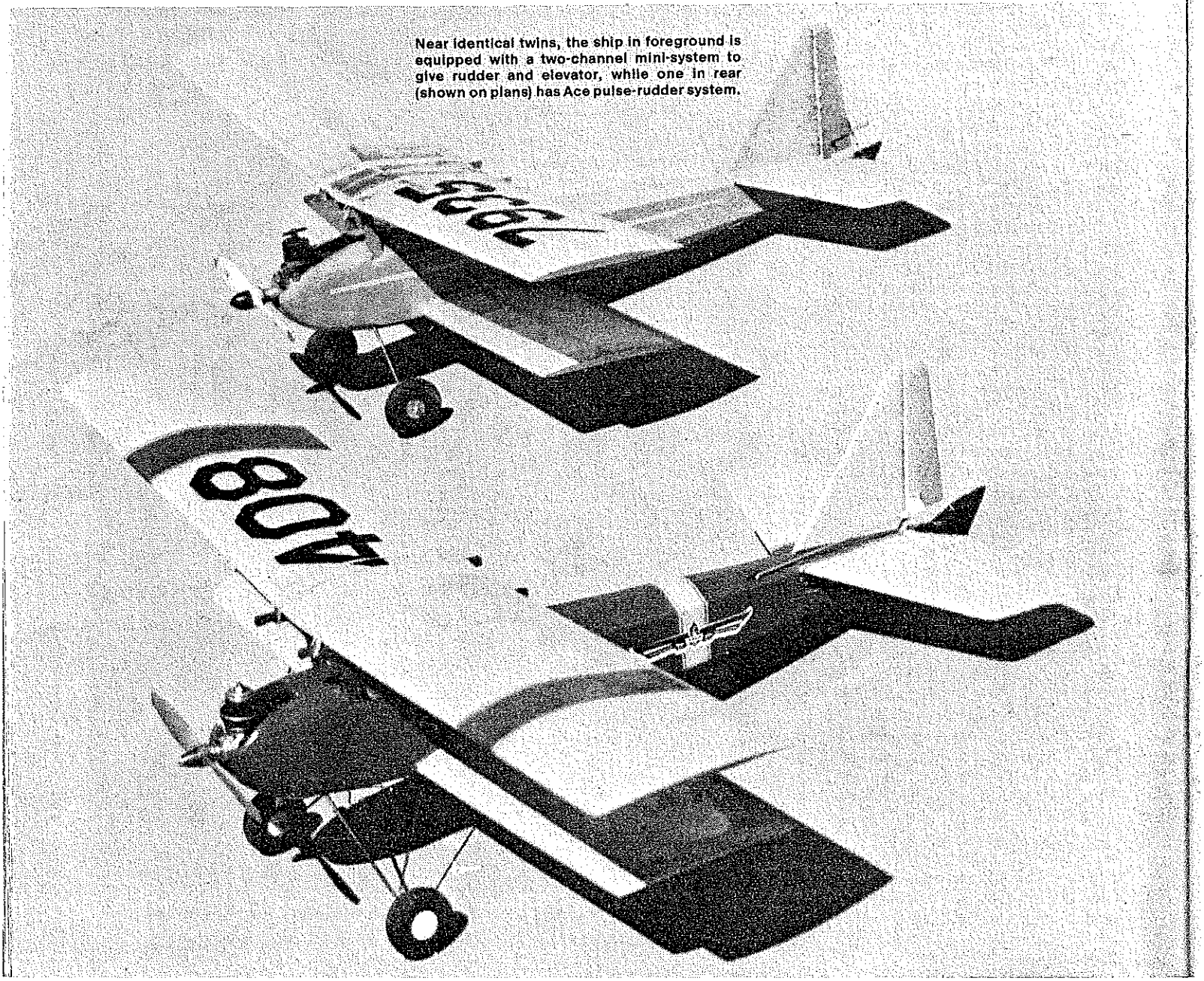
WHEN I started to design the Peliban, I really hadn't made any firm decision about some of its details. I wanted a smallish biplane, but should it have rudder and elevator, or just rudder control? What sort of engine should I use? Would I use a simple single leg undercarriage, or something built up? Problems, problems.

Eventually all the structure was more or less finalized, but still no decisions on the number of channels etc. . . Finally, inspiration struck. Rather than worry about all these decisions I'd make two models, one single-channel and one with two channels. I'd use the low-powered engine and the single-leg gear on the single-channel model, and a hotter engine, and the more complex undercarriage on the two-channel.

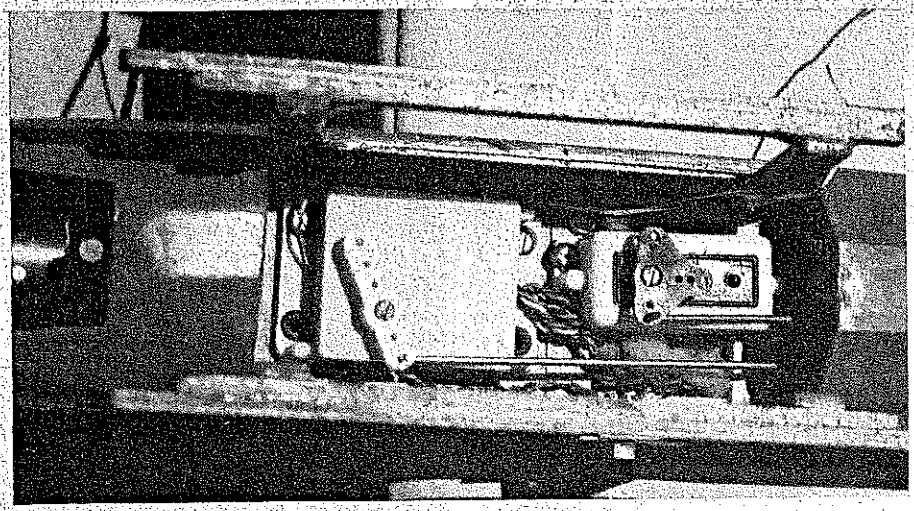
The single-channel model was fitted with an Ace radio, with the Baby Twin actuator, and a 1cc English diesel for the power unit. The other used a Cox .049 QZ, and a Cannon radio. Both models fly as expected, the single-channel version being the more sedate, and just right for a lazy afternoon of sport flying.

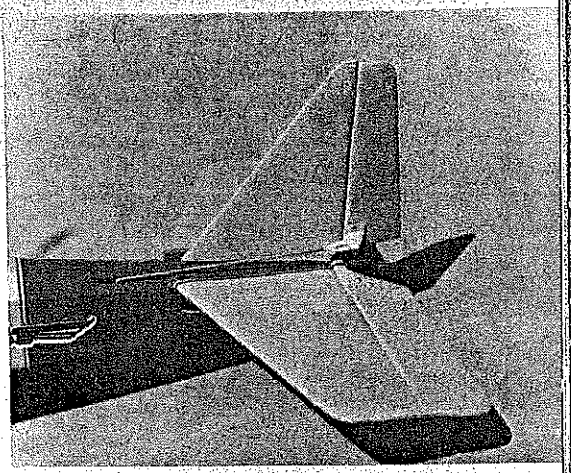
For more excitement the Cox-powered version should be tried. With a good propeller and some hot fuel, this model will keep your thumbs very busy.

The plans show the various pieces for building both the one- or two-channel versions, both undercarriage systems, and also



Near identical twins, the ship in foreground is equipped with a two-channel mini-system to give rudder and elevator, while one in rear (shown on plans) has Ace pulse-rudder system.





With wing and hatch removed the gizzards are exposed. Forward is the brick, on the CG, aft a mini servo. Right: Typical wire pushrod end, nylon rudder horn and adjustable nylon clevis. The sporty little bipe is great fun in confined spaces, stuntable without your getting uptight.

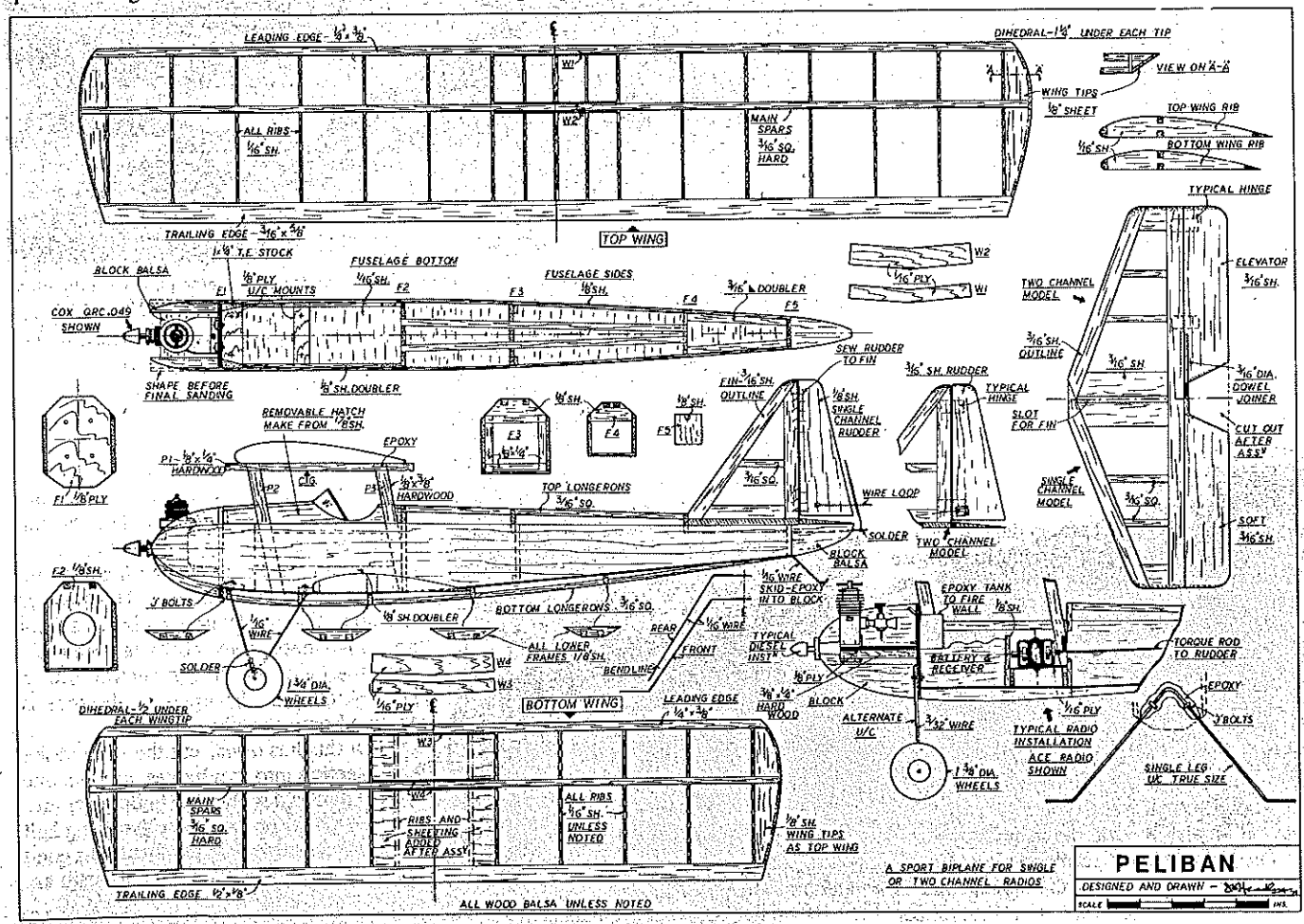
the mounting scheme for radial or beam-mounted engines. The wings and the basic fuselage are common.

On the two-channel model the rudder is made from thicker stock, for better compatibility with the hinges, whereas on the single-channel, a simple ⅛" sheet rudder is adequate, as this is sewn to the fin. In similar manner, the tail planes of the two versions are different.

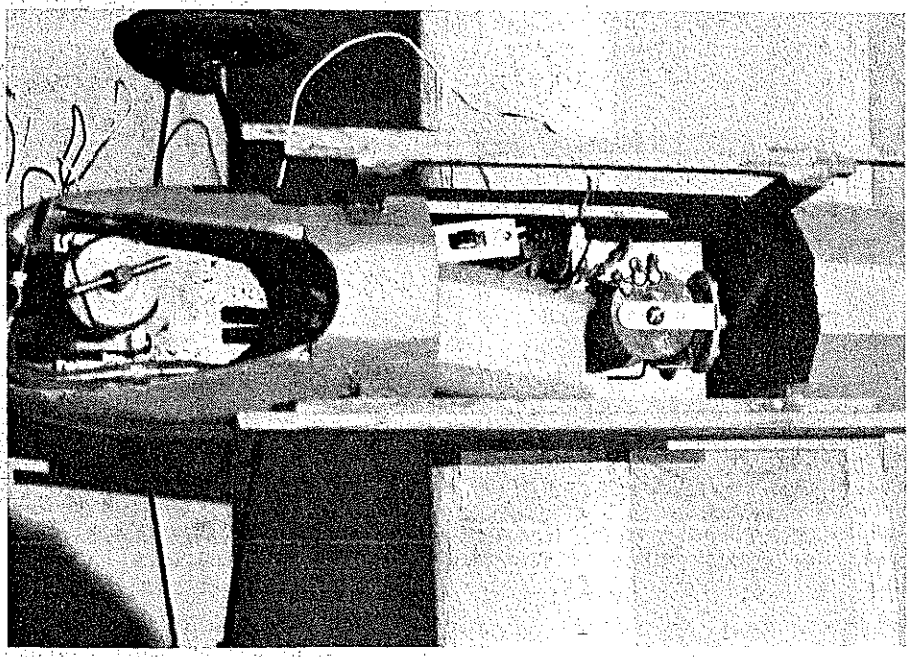
Naturally, it's better to use a higher-powered motor for the two-channel version, either the Cox QZR/C or a Medallion with a tank mount suggested. For the lower powered single-channel model either a mild Cox, of a diesel or about 1cc capacity will be OK.

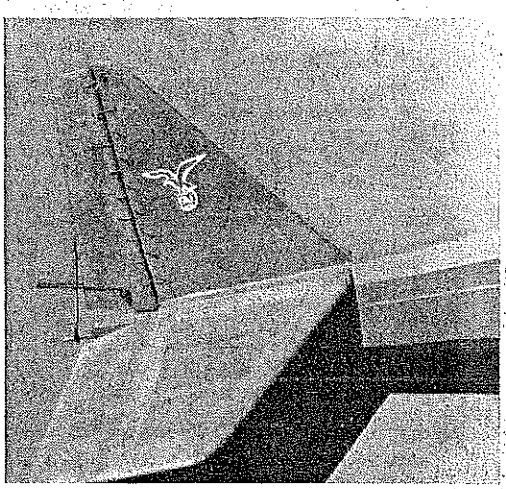
Fuselage: It is basically a sheet box, with provisions for either a radial or beam-mounted engine, and has an opening on the topside, underneath the top wing, for installation and access to the equipment. Construction begins with selecting two similar pieces of ⅛" sheet for fuselage sides. It's important to get these sheets of similar weight and bending stiffness, otherwise a rather lopsided fuselage might emerge. Place the plans over one of these ⅛" sheets, and with a pin, prick out the outline of the side onto the sheeting. Join these dots with a soft pencil, and then cut on the outline. Sand smooth, then transfer this outline onto the other piece of sheet, and cut out that fuselage side. Tape the two sides together, and make a final pass with the sand paper, so that two identical sides are obtained.

Next step is to make the pieces of the cabane structure. These items, P1, 2, and 3 are all hardwood, and are cut to size. After covering the plans with wax paper, the right-hand fuselage side is pinned down onto the plan, and item P1. Epoxy items P2 and 3 onto both the fuselage side and P1. Next, make and cement into place the ⅛"



FULL-SIZE PLANS AVAILABLE . . . SEE PAGE 120





The Ace system in the rudder-only job. Forward is the receiver, behind it the pulse magnetic actuator. The actuator, and rudder, slave to the transmitter pulse, but average out to the stick position. Note Mills diesel. Right: Wire control yoke and simple, figure-8 stitch hinging.

sheet doublers in the forward fuselage area, and also the 3/16" triangular strip which serves as additional mounting area for the tailplane. When all this gluing has dried, remove the side from the plans and make the left fuselage side, using the back side of the plans.

The frames come next, F2 to F5, and these can be made as illustrated on the plan. F1, however, will depend on which engine you intend to use. For the radial-mounted Cox the F1 sketched on the plans is made, but for any other motor make suitable modifications before gluing F1 into place. Installation of the frames begins with F1 and F2. When these are secure, bend the rear fuselage sides together, and glue F3, 4, and 5 into place.

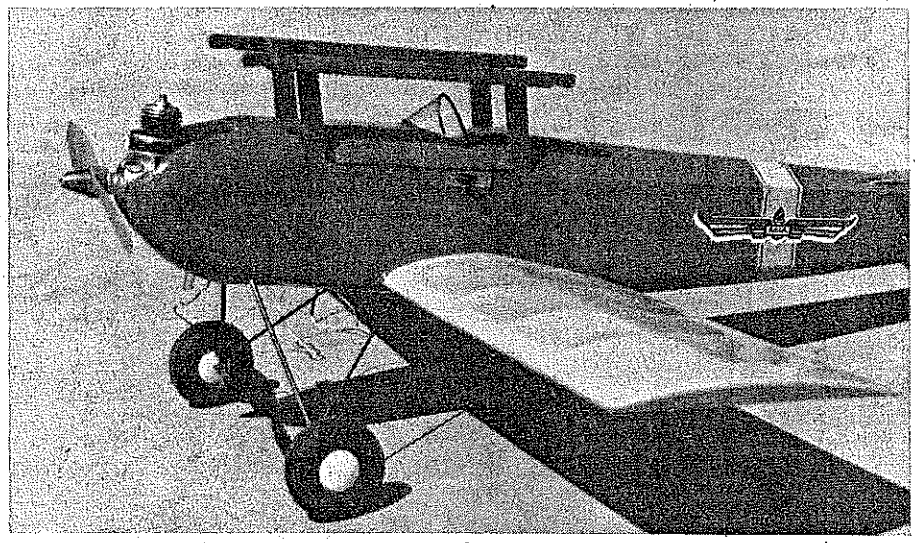
If you intend to use the single-leg undercarriage, this should be made and attached to F1 before this frame is finally glued into place. Next, add the 1 × ¼" trailing edge stock behind F1 for reinforcement, then the balsa blocks around the engine, or, if you're intending to use the beam-mounted engine, the hardwood bearers, and the plywood plate, are now installed. The balsa blocks around the nose are arranged to include some way to drain used fuel away from the fuselage.

These balsa fairing blocks depend on the motor used. The object is to fair in the nose to some pleasing shape. However, for practical reasons, some cutouts, for example for the needle valve, may be unavoidable.

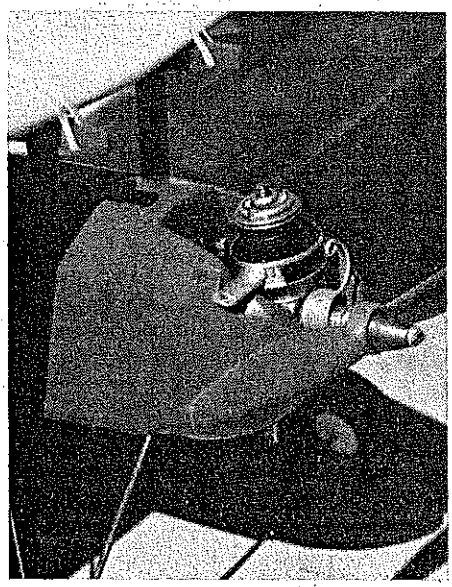
The remaining items to be attached at this stage are the two upper 3/16" sq. longerons.

Wings: The upper wing has a larger span and chord than the lower wing. Straight dihedral is used on both wings, the top wing having larger dihedral than the bottom.

The lower wing is permanently attached to the fuselage, while the upper one is attached to the cabane structure with rubber bands. The upper wing is removed for access to the radio compartment. Both wings are constructed in a similar manner.



You have a choice of Vee landing gear or simple single strut installation—also shown on the plan. Wing saddle struts are made from hardwood—epoxied—and uprights go down into fuselage.



The ubiquitous Cox with spring starter. The quiet QRC version is ideal for schoolyard flying, or where neighbors might complain.

Top Wing: Being only 30" span the top wing is first built in one piece from 36" lengths of balsa, then cut in the middle and rejoined using plywood doublers at the center section.

Pin down onto the plan the leading and trailing edge pieces, plus the 3/16 sq. lower main spar. Cut out 18 upper wing ribs from hard 1/16 sheet, notch these for the main spars, then glue all but the central four in place. After this the upper main spar is cemented onto the ribs.

When this has dried, cut the wing at the center section into two halves, and pin one of these halves flat onto the building board. Trim the center ends of the other wing half to the correct angle, making sure that a good butt joint is obtained when the wings are

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minutes. Exhaust was hardly audible.

S.A.M. Champs: Lyn Haslam says the Saltair Modelport outside Salt Lake City, Utah is a much improved site after last year's New Jersey Pine Barrens. Dates are July 24, 25, 26 (the week before the Lincoln Nats). These dates coincide with the Mormon Pioneer Days festivities in Salt Lake. Clarence Haught will have more details in next month's *Model Aviation.*

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RC Pylon/Hager

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Here are some tips on 500 racing that might be helpful. As in most racings events, you only get out of it what you put into it. If you want to win, you must put out an extra effort. Build the plane light. A racing airplane must be well built, so don't skimp. Spend a little time checking the wood in your kit for light weight. Replace any that seems on the heavy side. It is important to use the proper amount of glue. Glue running down the inside of the plane only adds extra weight. The weight of the plane is very important, so don't use too much glue. But try to make a well-built plane. A little extra effort and time in building will benefit you in the end. A crooked plane will be a disadvantage from the start. If you use an iron-on covering, make sure that all the edges are down. I use super MonoKote to seal all control surfaces. A hinge line that is sealed will create less drag. Your control surfaces will be much more effective. Next time you are at a contest, take a look at some of the faster guy's planes. You will find that they are well built planes.

It takes a lot of practice to fly a good course. The neat thing about the 500 is that you are going to use this plane as sport plane, so every time you fly, it can be a practice session.

In future issues we will discuss other types of racing. Next month we will go into safety. This is something that we all need to get involved in, no matter what we fly.

This column is for you the reader. Any comments on things you would like to read about, please let me know. You can send mail directly to me.

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Peliban/Headley

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aligned at the correct dihedral angle. This angle is found by putting a wood block 2½" high under the tip of the free wing panel. Epoxy the spars together in the center section when a satisfactory joint has been made, then make and epoxy in place the 1/16 ply wing joiners W1 and W2. Add the remaining center section ribs. These will need a little trimming before they can be glued in place.

The wing tips, made from ⅛ sheet balsa, are the last items installed in the upper wing. After these have been attached, the wing is sanded to its final contour, and then prepared for covering.

Lower Wing: It is constructed in a single piece, exactly in the same way as the top wing. Pin down onto the building board the leading and trailing edge pieces, and also the lower main spar. From hard 1/16" sheet cut out ten lower wing ribs, and glue these in place. Cement the upper 3/16" sq. top main spar into these ribs, then, as before, cut the wing into two pieces on the center line, and rejoin using the 1/16 ply wing joiners W3 and 4. Add the ⅛ sheet wing tips, then sand the wing to the airfoil shape shown on the plans. Construction of the lower wing will resume after the wing has been glued onto the fuselage.

Tail plane: This begins with the assembly of the outline, composed of strips of 3/16 × ½ balsa. Pin these down onto the plan, then make the tail plane tips from scraps of 3/16 sheet, and glue in place. The four required ribs are of 3/16 sq. Center section of the tail plane is reinforced by two pieces of 3/16 sheet. The gap between them provided for the fin, attached during the assembly.

For the single-channel version the tail plane is completed by adding two pieces of softish 3/16 sheet to represent the elevators. Glue in place, then thin down to about 1/16 at the trailing edge. The elevator for the two-channel version is cut from slightly harder 3/16 sheet. A good way of making two-piece elevators is first to make a single, full-length strip, which initially is notched in the center for the 3/16" dowel joiner. Epoxy this dowel in place, after which you can cut out the V-shaped notch at the center. This elevator is chamfered to about 1/16 thick at the trailing edge. Sand its leading edge to a full radius.

While you have the sanding block in hand a full radius is put on the tail plane outline.

Fin and Rudder: The fin is constructed in a similar way to the tail plane. An outline of 3/16 sheet is made, then the single 3/16 sq. rib is added. Since the fin extends into the tail plane, leave enough material to make the key piece. Sand a full radius on all the outside edges (except the bottom strip).

The rudder thickness depends on which system you're going to use. For single channel the rudder is cut from a piece of ⅛ sheet, then rounded along the edges. For two-channel use 3/16 sheet, and chamfer in a similar manner to the elevator.

Assembly: The first items of concern are the fuselage and the lower wing. Cut slots in the fuselage for the wing leading edge and main spar only (the trailing edge rests on bottom of the body), then check that these two items are correctly aligned before cementing the wing into place. Attach the tail plane, making sure alignment is OK, in both top and front views, before gluing. Cement fin into the slot provided.

If you use the two-legged undercarriage, it is now installed. The wiire legs are attached to two ⅛ plywood plates with J bolts, plates being notched into fuselage sides. Check alignment before finally tightening the bolts, then epoxy nuts in place.

Close in the bottom of the fuselage with 1/16 sheet, grain running crosswise. Follow this with lower fuselage frames, then add the two 3/16 sq. stringers.

Make two additional lower wing ribs from ⅛ sheet, trimmed to fit wing root section, then glue in place in the wing, and to fuselage side. The resulting small wing bay is then covered with 1/32 sheet, top and

bottom.

Radio Hatch: This hatch is shown on the plans. For satisfactory fit, it is constructed on the model, thus truly conforming to contours. It is made from ⅛ sheet, and consists of two end frames, two sides, and a top. Build this as a complete box, then cut out the cockpit outline from the sides and the top, and add the windscreen. A small screw keeps hatch in place.

Single-Channel Installation: Shown on plans is a typical single-channel system. Shown is the Ace, with Baby Twin actuator. If you use another system, make the necessary changes to the structure before construction has proceeded too far. Following instructions assume the Ace system.

Wrap receiver and battery in foam rubber, and locate as far forward as possible. A small scrap of frame made from ⅛" sheet helps to keep these items in position.

The actuator is bolted to a 1/16 plywood platform built over the wing structure in the fuselage. This platform is rigged at a slight angle so that the torque wire can run straight back to the rudder. A small nut epoxied under the ply platform is used for the actuator attachment. The torque wire is bent at right angles at its forward end, and this end is attached to the arm on the actuator with a scrap of plastic tubing. At the back end, the torque wire runs through the balsa block fairing, and a scrap of inner nyrod, epoxied inside this block, is used for a bearing.

Rudder actuator is made from a scrap of wire, a small loop bent in its lower end. With the actuator installed, together with the torque wire, slip this loop over the rear end of the torque wire. Center the actuator, check that the small wire is vertical, then solder these two wires together.

Rudder actuator wire fits into a loop bolted to the rudder, and a small piece of plastic tube slipped over the wire here helps reduce interference with the radio.

Two-Channel Installation: I used a Cannon, and this fitted into the radio cavity quite easily. The receiver and servo were screwed to a ⅛ ply plate which was epoxied onto two hardwood rails attached to the fuselage side. The battery pack was located in front of, and underneath this ply plate, installed prior to fitting the receiver. Pushrods are made from 1/16 wire and ¼ sq. balsa, connecting the servos.

This is a typical installation, and Ace servos, or the new small Kraft equipment can be fitted. The emphasis is on placing the heavier pieces of the radio forward.

Covering: The single-channel version is covered with colored tissue, clear dope finish on the wings, color dope on the fuselage—this to keep the weight as low as possible, because the engine I intended to use isn't the powerhouse it used to be. For the two-channel model I used Solarfilm all over. A lightweight finish for the lower

powered version is a good idea, so don't get too carried away with the trim scheme.

Flying: First, a ground-check is in order. Determine that the model balances at, or around the CG location shown. Look for, and remove any warps.

I found that the two-channel version will take off quite happily from the runway, but the single-channel model was better off if hand launched. Capability is not determined on the first flight, so perform several test flights making small revisions to the balance, or the control throws, to determine the optimum settings. From then on it should all be fun.

CL Aerobatics/Paul

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according to PAMPA President Keith Trostle. The Museum's 7000-foot runway will accommodate most anybody's line length and will be available all week for practice. For those who remember the '76 Nats, this was the runway used by CL racing events and RC pylon. This will be the first combined tryouts for stunt, speed, and team race since 1971. Some of the Precision Aerobatics judges have already been lined up by event director Keith Trostle, and World Champion Bob Hunt is scheduled to be the assistant event director.

Doug McGinnis of Fawn Grove, PA 17321, has written to *Model Aviation* wanting to know how our stunt planes can fly when we have a symmetrical airfoil which should create reduced air pressure on both top and bottom of the wing. Perhaps some of you theoretical types could help clear this up.

From Lou Dudka of New Jersey comes a method of finishing a stunt plane using Hobbypoxy white undercoater H-19. He says to put on two coats of clear dope over the bare wood. This is sanded lightly with 220.

Hobbypoxy white undercoater is then mixed up 2½ parts of white and one part hardener. This is allowed to sit for two days in a jar open, after mixing, for "precuring." Then the undercoater is applied with the playing card method. That is, brush it on thickly and then use a playing card or other stiff cardboard to scrape it off. A second coat applied quite lightly is then put on the plane. Sand these with 150 to 220 paper dry. This should fill the wood completely.

Next, a base coat of Aero-gloss clear is sprayed on. Two coats of this is best to give the paint a good base to adhere. Then your favorite paint is applied for a "dynamite" finish. According to Lou, this method just will not shrink upon final drying.

It is still not too late to volunteer to work at the 1979 Nationals in Lincoln, Nebraska, July 30-August 4. Event director Lanny Shorts still needs judges, recorders, circle engineers (set up and paint lines), assistant pit bosses, score tabulator couriers