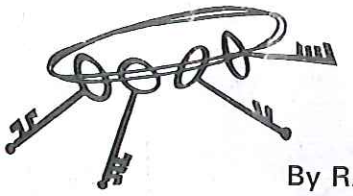

"PASKEY"

By RANDY RANDOLPH . . . All the performance capabilities of the hot .60-sized pattern machines have been wrapped up in this efficient 42-inch span .19 powered bird.

• Last year our club, The Dallas R/C Club, instituted a plane-of-the-month and a plane-of-the-year contest, with a substantial prize to the winner at the end of the year. The first winner of this prize was a five foot, .71 powered, standoff scale Gloster Gladiator, a beautiful ship and a deserving winner. I was witness to the test flight of this bird, and it was an interesting experience . . . to me, not the builder. The least exciting part of the flight was the landing; a wheel-landing preceded by a fifty-foot vertical dive. The airplane obviously survived, but my friend suffered from a bad case of intestinal interruption for some weeks after. Although the plane had been balanced to the indicated CG, it did not become flyable until the addition of two pounds of lead to the nose. It did become flyable, very flyable, for my friend also won the Southwestern Championships with it a few months later, against some of the toughest competition ever in this part of the country.

I use this story as an introduction because it contains several elements that will not be found in PASKEY. It is not an award winner, it does not cost an arm and a leg to build, it does not take three months to finish, it does not take a gallon of fuel for an afternoon's flying, it is not beautiful, but most of all, it does not require seven notches on a five-notch pucker string to test fly. On the credit side, it is easy to build, it looks kind of like an airplane, and it is a dream to fly. It will fly anyway you want it to fly; with the clevises in the outer holes, it is a nice and easy learning airplane for Saturday morning; with the clevises moved in for full control movement, it is a rough and tumble fun-fly contestant on Sunday afternoon.

PASKEY is a gentle airplane, and a forgiving airplane; it will snap, but it must be forced to do so, and it will spin very flat, but recover rapidly. Landings are a pleasure, for there is aileron control all the way to the ground, and takeoffs are simply a matter of advancing the throttle and giving a touch of back stick. Don't forget the back stick, for this airplane has got to be flown; it will stay where you leave it, but you do have to leave it somewhere reasonable. In short, it is a stable, groovey aircraft with a wide performance envelope.

The tip plates are responsible for a lot of the performance; they provide low drag tips and help the built-in washout do its job of keeping the ailerons effective well into the stall. The square lines are not only easy to build, but the abrupt fuselage wing joint goes a long way in contributing to the excellent spin recovery. The somewhat ungainly fuselage gives excellent knife-edge flight characteristics, and the blunt trailing edges of the control surfaces tend to dampen response around neutral, which adds to the basic neutral stability of the design.

The original was powered by a rather old and well-established Webra .20, and it provides plenty of zip for all maneuvers, but this airplane will handle anything from a sick .15 to a hot .23 and be happy. A .10 with the new lightweight radio gear would make a good trainer at a very low initial investment and small upkeep. With the Webra, a gallon of fuel will fly PASKEY for 9 hours and 20 minutes. If you decide to build PASKEY, and I hope you do, let me suggest that you start by assembling. . .

THE KIT

Make a template of the rib from thin, stiff cardboard, and use it and a ballpoint pen to make a "printed sheet" on two pieces of medium 1/16 x 3 x 36 balsa, moving the template around to find the most ribs that can be cut from each sheet. You will need 24. After the ribs have been cut out and gang-sanded to the same shape and size as the template, take four of them from the stack and cut 1/16 from the top and bottom of each . . . these are the center ribs that will receive the sheeting; call them R2. Cut the gear mount notch in four more and call them RL.

The trailing edge sheeting is cut from a single piece of 1/16 x 4 x 36 balsa. Cut the sheet to a length of 22 inches before stripping them, and the rest can be used for the center-section sheeting. The wing spars are stripped from a sheet of 3/16 x 3 x 36 medium hard balsa. Cut 8 strips 3/16 sq. and 4 strips 3/16 x 3/8, the extra 3/16 sq. is for the stabilizer and rudder. The spar webbing is 1-15/16 x 1 inch, sixteen of them are from 1/16 balsa and four are 1/16 plywood. The trailing edge webs are all 1/16 balsa 1/4 inch high. Cut the dihedral braces and landing mounts from 1/8 plywood, and the landing gear braces, stabilizer spar doublers and tip plates are from 1/16 plywood. The leading edge is 1/4 sq. balsa.

Cut the fuselage sides from a single piece of 3/32 x 6 x 36 balsa. This can be made by edge-gluing two pieces of 3 inch wide stock to form the larger sheet. Pin the two sides together and gang-sand them to the same shape. Use the finished sides as a template to cut out the two 1/16 plywood fuselage doublers. The cabin doublers are 3/32 sheet balsa, cut as shown and notched to fit OVER the 1/16 ply doubler. Strip the 1/8 sq. for the longerons and uprights from medium 1/8 sheet balsa, and strip two extra for the wing trailing edge. Cut the cabin formers and the two-piece firewall from 1/8 plywood, glue the firewall together with epoxy, and drill for the engine mount bolts and fuel and throttle lines. The addition of 1/16 sheet for the fuselage top and bottom completes the kit.

FUSELAGE

Epoxy the 1/16 plywood doublers to the forward part of the fuselage sides, making sure of a left and a right, with the ply to the inside. Add the cabin doublers and the longerons and uprights. When all is dry . . . which is now if you use the new glues . . . once again pin the two sides together, with the ply to the inside, and sand them to the same shape with square edges, then drill the 1/4 inch holes for the wing hold-down dowels.

Place one side over the plan and mark the location of the cabin formers. While it is still flat on the plan, glue the cabin formers in their proper locations using a square or a right triangle to keep them vertical. When the glue has set, glue the other side on top of the formers, use the square to make sure that the two sides are exactly over each other. Place the fuselage over the top-view on the plan, epoxy the firewall into position, bevel and glue the tail together, and check for alignment. Sheet the bottom with 3/32 balsa in front of the wing and 1/16 in back of the wing . . . this is crossgrain. Cut the exit holes for the outer nyrods in the fuselage sides and install them,

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using epoxy and micro-balloons where they exit the fuselage . . . add the bulkhead in the aft section to steady them. Epoxy the brass tube fuel and overflow lines and the blind nuts for the engine mount to the firewall, and install the inner nyrod for the throttle pushrod. Extend this nyrod well into the cabin area. Install the fuel tank, using foam on the bottom and sides to wedge the tank in position. Add a 3/16 balsa bulkhead behind it, and attach the fuel and overflow lines. Sheet the top of the fuselage, from the firewall back about two inches, with 3/32 balsa, drill it for the inner nyrod nose-gear steering, and install the nyrod, extending it well back into the cabin area. Use epoxy and micro-balloons where it goes through the sheeting. Sheet the rest of the fuselage top with 3/32 balsa to the top of the cabin, and 1/16 from there aft. Cut all nyrods flush with the sheeting and sand the completed fuselage with 150-grit sandpaper.

WING

Cover the plans with the backing from Monokote (or use food-wrapping plastic) to keep the structure from sticking to them, and pin the bottom trailing edge sheeting in place over them. Glue a strip of 1/8 sq. to the back edge of this sheeting, and using a rib as a gauge, pin the bottom main spar to the plans. Glue the first RL rib near the center of the wing in place over the plan, and glue one of the plywood webs to it and the spar on the outboard side, as well as a balsa web at the trailing edge. The webbing makes an excellent spacer and assures that the ribs are perpendicular to the spar as well. Continue adding ribs and webs out to the tip with the other RL next. There are no webs between the last few tip ribs. After all the ribs are in place, glue the top main spar to the ribs and the webs, and add the leading edge. At this point, glue the plywood web inboard of the first RL installed, slide on the first R2, and glue it in place. Glue the top front spar in place and bevel the 1/8 sq. at the trailing edge to receive the top trailing edge sheeting . . . glue it in place. Lift the wing panel from the work board and glue in the remaining front spar. The other wing panel is assembled in the same order.

When both wing panels have been assembled, bevel the spars, and leading and trailing edges, where they will be joined to form the dihedral angle. This can be done with a sanding block or a bench or radial-arm saw. After beveling, join the two panels, with the main dihedral braces on either side of the main spars, and the trailing edge brace between the top and bottom sheeting. Place one panel flat on the bench and raise the other wing tip until the dihedral braces are flush with the top and bottom of the main spars at the center joint, and a good fit is had at the trailing edge. Support the wing at this angle and glue in all dihedral braces with aliphatic resin glue. Clothespins are quite useful to hold the braces in alignment while the glue dries.

Cut the front of the two remaining R2 ribs 1/8 inch in front of the main spar notch, and glue them together and into the center of the dihedral joint between the main spar and the leading edge. Add the 3/16 balsa gusset on each side. The aft part of the R2's are cut 1/8 in back of the main spar notch and glued on either side of the dihedral joint as shown on the plans to form the servo cutout. A piece of scrap 1/16 balsa sheet between them finishes the box, and another piece of scrap from the center of this box to the trailing edge completes the structure for sheeting.

Notice that the center sheeting is BETWEEN all of the spars, and that there is no sheet on the top of the wing between the R2's that form the aileron servo cutout. Glue in the landing gear braces, and the landing gear mounts, and the wing is almost ready for sanding.

Cut the ailerons from 3/16 balsa sheet and sand them to shape with 100 grit sandpaper on a sanding block. Cut 2 inches from the tip of each and glue these pieces to the trailing edge of the wing at the tip, UPSIDE DOWN. This provides the washout for the tips. Epoxy the aileron mounting hardware to the trailing edge center section as shown, the original used 1/16 I.D. brass tube with 1/16 wire bent to form the torque rod and horn. Relieve the trailing edge, and its backup block, to allow movement of the aileron horns where they exit the tubing. Notch and groove the ailerons to receive the torque rods; they are installed on the wing after covering.

STABILIZER AND RUDDER

The tail group is built in a very straight forward manner over the plans. The only thing to remember is to add the spar doublers before assembling the stabilizer. The rudder and elevator are cut from 3/16 sheet balsa, and pinned to their respective fixed surface for final sanding. I like to apply Hot Stuff, or Zap, to the bare wood where the control horns are installed to harden the wood at these locations.

COMPLETION

All parts should be sanded well with 150 grit sandpaper, round all the edges of the fuselage, the leading edges of the wing and tail as well as the trailing edges of the rudder and elevator. When you think you are finished, sand everything again with 220 paper.

The wing should be balanced at this time. Use a piece of 1/8 music wire for a fulcrum at the center of the wing and use the heaviest aileron on the side of the lightest wing panel, if it still doesn't balance, add weight to the light tip. The main spar can be drilled at the tip to accept the necessary amount of weight.

COVERING

This airplane should be covered with plastic film. I like Monokote, and use it for hinges as well as covering. Follow the instructions packed with the film. When covering the fuselage, overlap the firewall about 1/16 inch with the film when ironing it on, then paint the firewall with a matching color of epoxy paint, or plain epoxy glue. This will seal the edges of the covering and make the airplane last much, much longer. Black Monokote cut into 1/16 wide strips makes very good striping to separate colors for trim.

When the covering is complete, cut the covering away from the center section of the stabilizer, top and bottom, where it will contact the fuselage, and epoxy it into the cutout at the rear of the fuselage. Cut the covering away from the top of the fuselage where the fin mounts, and epoxy it into place. Do the same for the tip plates, and epoxy them to the wing tips. Hinge and mount the rudder, elevator, and ailerons. Epoxy the wing hold-down dowels into place.

Install the engine mount with 4-40 x 1/2 inch bolts and drill it to accept your engine. A 1/8 hole should be drilled down through the back part of the mount for the nose gear, as shown. The main gear is bent from 3/32 music wire to the shape shown on the plans, and installed on the plywood landing gear mounts with landing gear mounting strips and small screws. The strips are formed over the wire, or already formed strips can be purchased. Use epoxy in the stop hole and the screw holes when making final assembly.

The nose gear is bent from 1/8 music wire and a wheel collar is installed just above the coil to bear on the bottom of the engine mount. It is best to solder it to the gear. Another wheel collar at the top secures the gear. The steering arm is mounted above the top collar to engage a piece of .040 wire from the rudder servo through the Nyrod at the top left of the fuselage. Mount all wheels, and bend and epoxy the

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tail skid in the location shown. Mount the engine.

I like to mount all the servos in my airplanes in 1/8 inch plywood trays with small wood screws through the grommets. The tray can then be moved back and forth to locate the CG, and then glued in place. The aileron servo is mounted on plywood pads glued to 3/16 x 3/4 balsa risers which are glued to the front and back of the servo mounting cutout in the top of the wing. The servo should fit as far as possible down into the cutout.

Hook up the ailerons with commercial hardware. Check that they move in the correct direction, with the bottom of the ailerons flat with the bottom of the wing when in a neutral servo position. Install the elevator and rudder inner Nyrods, and hardware, with these surfaces neutral. The throttle hookup is florist wire from the servo to the engine throttle arm. Bend a kink in it for override protection.

Connect the nose gear steering rod to the opposite side of the rudder servo arm from the rudder pushrod and check that the steering is in the correct direction. Apply wing saddle tape to the wing mount. Connect the aileron servo, and strap the wing into position with rubber bands. And now, let's go to the flying field.

FLYING

Range check the equipment. Watch all control surfaces for proper movement. Make a final check on the C.G. location. Now, fire it up and taxi into the wind. . .

You can expect PASKEY to track straight, even in some crosswind, and you will have to apply back pressure on the stick to rotate. With the clevises in the outside holes of the elevator and rudder, response will be smooth but by no means slow. Do not expect to make rudder turns, as the rudder will not cause the ship to bank. The turn will be very flat, and wide, with the wings level. Knife edge flight will require little or no aileron, after it is established, and not much rudder to hold the nose up. Loops are round, and any diameter you want, and tracking is excellent.

Snaps and spins require full aileron, and full rudder, as well as full elevator. Recovery is the neutralization of all controls. Outside maneuvers are just as easy as inside, requiring only slight down trim for inverted flight.

The tail skid on the airplane is necessary, as the landings are slow and at such a high angle of attack that the tail drags almost every time. The ailerons are effective all the way to the ground.

The name of this bird came from the fact that it looks a little like a Pazmany, and a little like a Cherokee, and a whole lot like a model airplane; that makes it a "passkey" to much good flying.

BILL OF MATERIALS

4 sheets 1/16 x 3 x 36 medium balsa for wing ribs and sheeting.

2 sheets 3/32 x 3 x 36 medium balsa for fuselage sides and sheeting.

2 sheets 3/16 x 3 x 36 for spars and movable surfaces.

8 pieces 1/8 sq. x 36 balsa for longerons and uprights and trailing edge.

2 pieces 1/4 sq. x 36 balsa for wing leading edges.

1 piece 1/8 x 6 x 12 plywood for firewall, formers, braces and mounts.

1 piece 1/16 x 12 x 12 plywood for fuselage doublers, braces and tip plates.

1 piece 1/4 x 12 hardwood dowel for wing hold-downs.

Kraft engine mount

Kraft tank, 4 oz.

1/8 x 3/32 music wire for landing gear.

Strip aileron mounting hardware, 2 control horns and 4 clevises.

Two 36 inch lengths of inner and outer Nyrod.

Landing mounting brackets, two sets.

Nose gear steering arm

Wheel collars for 1/8 and 3/32 wire

Four 4-40 x 1/2 inch bolts

Four 4-40 blind-nuts

1/8 O.D. brass tube, about 2 inches for fuel and overflow lines

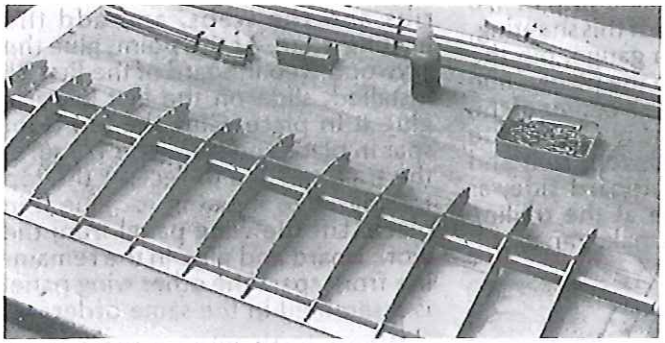
Epoxy for firewall and Nyrods

Aliphatic resin for dihedral braces and landing gear mounts

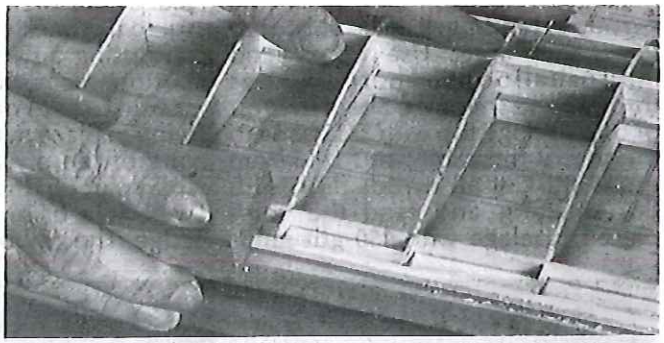
Hot Stuff, or Zap, for everything else

One roll of Monokote and one

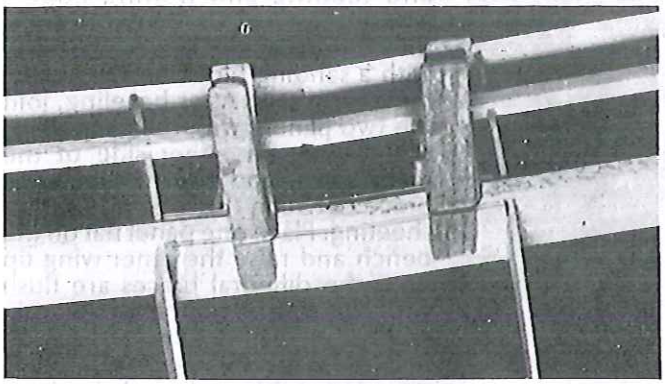
One roll of wing saddle tape •



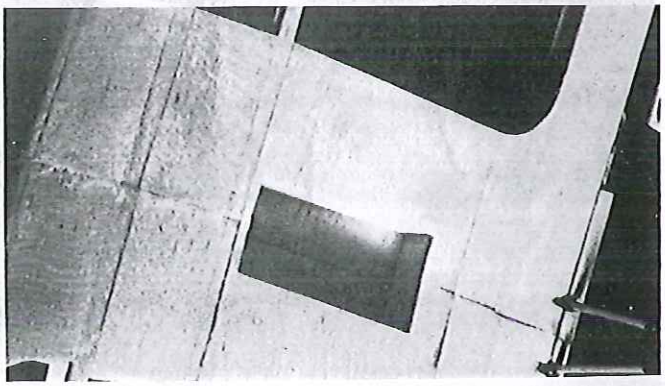
Accurately cut, vertical grain, spar webbs are an aid in obtaining correct rib alignment. Make yourself a "kit" before assembly starts.



Sanding block is used to prepare structure for trailing edge sheeting.



Dihedral braces are clamped inplace with clothes pins while glue dries.



Center section ready for sanding. Note that sheeting is let in between spars, and ailerons are notched to take torque rods.