

ARTWORK: JIM KOSTECKY

Monocoupe

Traditionally, it seems this article should start this way: "The Monocoupe was designed in nineteen something or other by so and so because of etc., etc." Well, if our illustrious editor permits, I would like to indicate how this model really happened and I'm quite sure it will strike a responsive chord in everyone somewhere along the way. "My" Monocoupe was not built to see how accurately I could reproduce a real object on a small scale. It was done to recapture a long-ago feeling and express that feeling in tangible form.

When I was a kid the age of twelve was a magic number. When you were twelve you finally paid adult fare on the bus and full price at the movies. You also got to go fishing in a boat on Lake Erie with your Dad and were finally old enough for a "two-wheeler" (young kids read "10-speed"). Somehow my Dad, who equated gas model airplane engines with chopped off fingers and complaining neighbors, arbitrarily decided the ownership of a "gas engine" to be included in this age group. Consequently, I could hardly believe it when at the "tender" young age of eleven he allowed me to use my life's savings (\$2) to buy a used Ohlson and Rice .23 from a kid up the street.

We spent hours flipping the prop trying to

get the thing running on fuel in a Testor's dope bottle with a piece of neoprene tubing stuck in it. Finally we got in the family car and headed for town and that magic place called the hobby shop. That place with unique odors, interesting guys, and, above all, an endless array of built models, kits and accessories where I could have spent my whole life.

Half an hour later I stood with my O. & R. .23 in my hand listening to the stinging sound of silence. Mr. Biggs had put it in a test stand, fired it up, and, thirty seconds later after a metallic clank, I was informed the connecting rod was broken. My Dad even had to pay him 75 cents for his trouble!

A couple of things happened that day. I discovered a side of my Dad I hadn't seen before and two models vividly impressed themselves on my mind. I can remember holding my broken engine and looking up at one of the most beautiful models I had ever seen. It was a Cessna 195 control-line model built from a Berkely kit with another O. & R. .23 in it. It was cream with a simple red stripe down the fuselage. Totally beautiful in its simple elegance. Across from it on a shelf was a kit. That was a Sterling Monocoupe and the photograph on the label made it perfectly apparent I had to build a model like

that someday. Round in all the right places, perfectly proportioned and with a personality that held immeasurable appeal—I was captivated. (How was I to know this same description would be appropriate to several other models and my future wife.)

For the next thirty years that little airplane would appear in a book or magazine and awaken memories of that day in the hobby shop with my Dad, my first engine, and an exciting future before me. Then it happened. One day sitting in my classroom was a sixteen inch span, rubber band Monocoupe built only the way a twelve year old can build his first stick and tissue model. Somehow that same nifty personality showed through the wrinkles and misalignment and a deal was made. For the next five study halls Michael could come to my class and work on a model in exchange for his cut-up, glued-up, ripped, and pin-holed Monocoupe plans.

Design considerations

I had been flying .020 old time free-flights with pulse rudder for some time and this was the point of departure for the Monocoupe. With a screaming Tee Dee dragging those little critters at a steep angle up to a mere speck I knew how I didn't want it to fly. The



PHOTOGRAPHY: JIM KOSTECKY

This quartering view of the Monocoupe shows all you need to get up and go. The Ace Pulse Proportional unit was used to give directional control and to

keep weight down. To keep the plane from going "outa' sight", Jim selected a Pee Wee .020 with a Davis Diesel conversion using a 6-3 prop.

Capture the spirit of the 1930's with this schoolyard scale rendition of an all-time favorite. For single channel pulse or micro-multi.

By Jim Kosteky

best part of the flight, for me, was watching the sun shine through the translucent covering at about 150 feet altitude. It was high enough to let you know it was flying but low and slow enough to let you see its shape and beauty. I wanted the Monocoupe to fly slow at about that altitude and float in for a landing on those calm summer afternoons or evenings in the schoolyard near my home. It would be powered by a Pee Wee .020, hopefully have a six ounce wing loading and use an Ace Pulse Proportional System. The drawing began to take form.

First, the rubber plan was doubled. That didn't give me quite the area I needed so I stretched the span to 36 inches. This gave me an aspect ratio similar to the old-timers I'd been flying yet still look okay. Stabilizer area was increased, incidence determined, and structure engineered. "Less is more", a design concept I subscribe to, was instrumental in selecting sizes and materials. Don't beef anything up! It gets heavy, flies faster, and breaks easily.

A Pee Wee will swing a large prop but I've broken more than one crankshaft in a crash because of the leverage involved. Why not a Davis Diesel conversion? So, I did. The conversion includes a stronger crankshaft. The whole works swings a 6-3 prop pretty nicely

which helps get some air moving outside the large diameter cowling. An unconverted engine should still do the job okay. The geared prop idea seems to have potential except for the weight in this case. The whole airplane ended up at eight ounces for an approximate 6-1/2 ounce wing loading.

The Monocoupe, as presented, is my impression of the aircraft. The appearance and charm the original has, for me, been retained; but, flyability has not been compromised. The drawing shows a version which I hope to build for one of the miniature multi-channel flight packs available. I swear the stick on my Ace pulse transmitter is bent at a 30 degree angle from trying to flare out landings with an elevator control that doesn't exist. If you build it for pulse rudder only, add 1/16 inch positive incidence to the wing and about three degrees down and two degrees right thrust to the engine. Modify the rudder so you have a 1/8 inch sheet movable surface of about one inch chord at its widest point. The bottom section should be stationary so you can route the torque rod through it. If you have a pulse system, I'm sure the preceding information is more than adequate.

Wings and tail

Cut the drawing of the outboard wing from

the plan and tape it to the major portion of the wing drawing. Fasten the plan to the building surface and cover it with Saran Wrap. Get your favorite adhesive (mine is the thin and the thick cyanoacrylates) pins, pliers, and cutting tools. A number eleven X-acto knife and a fine razor saw are indispensable.

The tail surfaces build quickly and are a good place to start. The outlines are 1/8 inch square or sheet balsa as are the interior pieces except for some 1/16 x 1/8 inch diagonals. The elevators are joined with a piece of 1/16 inch wire. Think about your favorite hinging method. This will be affected by radio choice as well as covering material.

The wing is next and kind of fun. Cut out the appropriate number of ribs from firm, light 1/16 inch sheet balsa. The main ribs as well as center ribs are traced from the fuselage side view. Tip rib patterns are under the right hand panel on the plan. Trim the 1/8 x 3/16 inch spars as shown on the detail. Shape the 1/8 x 1/16 inch trailing edge. Pin the spars to the plan. Locate the inner and outermost R-2's on the spar. Cut the tip pieces from 1/8 inch sheet and pin them flat to the board. Glue them to the spar and trailing edge. You might consider shimming the trailing edge up 3/16 of an inch for wash-out. I didn't and it

flies fine. However, don't get the leading edge high! Now add the rest of the R - 2's and tip ribs. Add the leading edge. Be sure the leading edge and tips join securely. Some trimming or filling may be needed to insure wash-in doesn't occur. Now add all the half ribs. It's now time to build the center section and join the wings at the same time. Line up the inner ends of the leading and trailing edges with the edge of the bench. Block the tips up two inches, then sand the correct dihedral angle into the ends of the wing. Don't break the overhanging spar off!

Position the wing panels back on the plan. Block up the tips again and glue the spar filler in place. Pin down the center section trailing edge and the $\frac{1}{16}$ inch bottom sheet between the spar and trailing edge. Add the three R - 1 ribs. Add the leading edge. If you haven't done so yet, add all the rib gussets. Sheet the top of the center section. Remove the wing from the board and finish the bottom planking. Blend the bottom of the tip leading edges to match the airfoil. Sand the wing. Make sure you have included the little strut reinforcements.



With the cowl off, it's easy to see (above) the characteristic button head of the diesel. The struts are functional (below) and attach easily. Imagine a calm, peaceful summer evening (bottom)

The fuselage

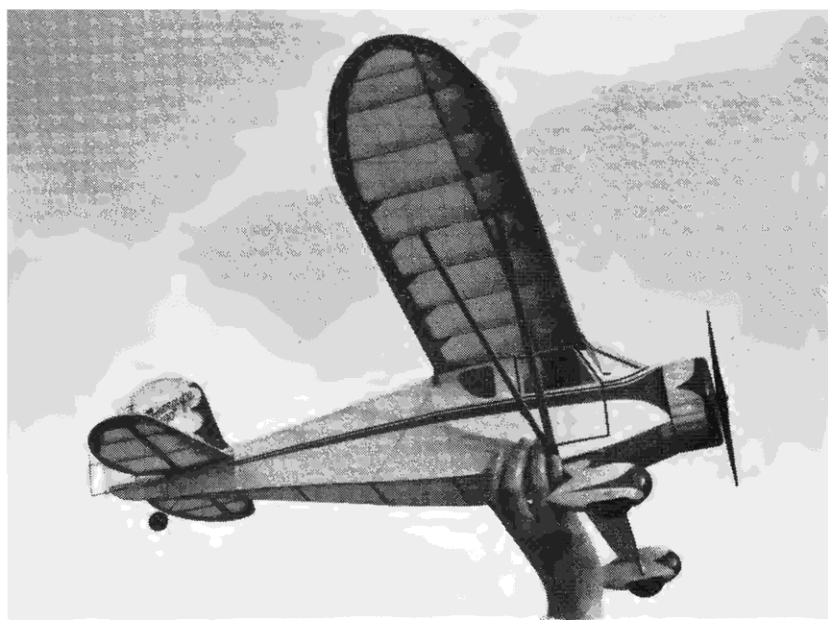
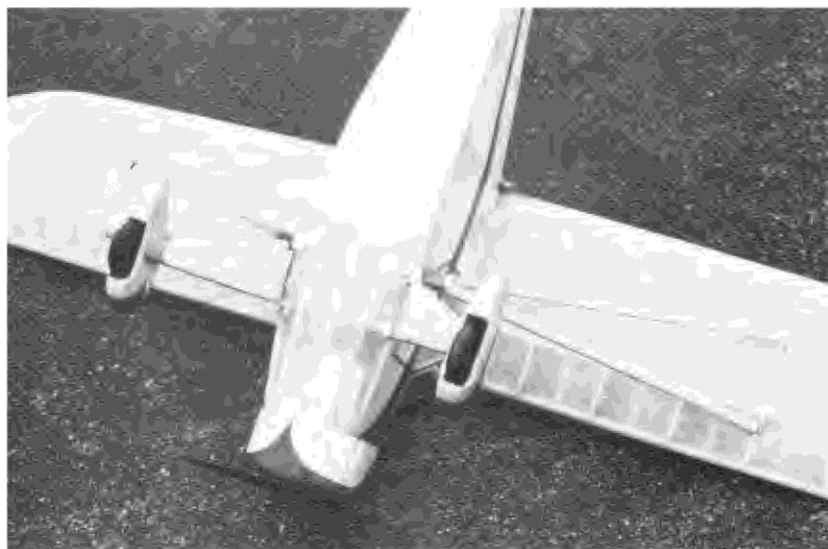
The fuselage is fun. Get the worst part of the job out of the way by cutting out the firewall and mounting the engine with blind mounting nuts. Bend the landing gear from $\frac{1}{16}$ inch music wire and sew and epoxy it to the $\frac{1}{16}$ inch plywood landing gear mount. Unmount the engine.

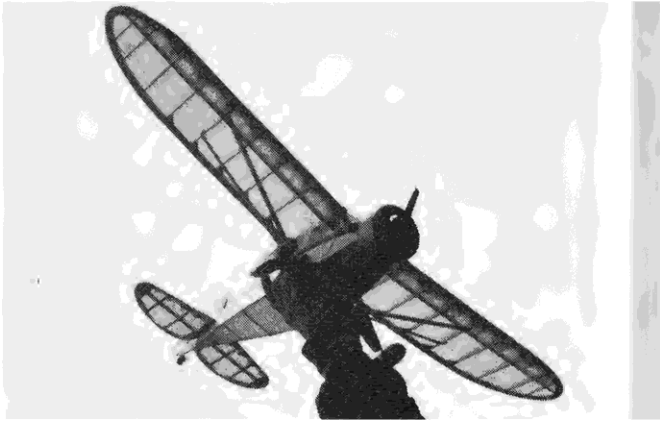
Build two identical sides from $\frac{1}{8}$ inch square balsa. Make sure you include the $\frac{1}{16}$ X $\frac{1}{8}$ inch diagonals. Next add the forward $\frac{1}{16}$ inch balsa sheeting to the sides. Cut out the windows. Aren't you glad you made a right and a left one? Place the fuselage sides on the board inverted, resting on the wing saddles. Using thick cyanoacrylate, drafting triangles, and three hands join the sides with the crosspieces located in the cabin area. Draw the rear sides together and add all the cross pieces aft of the cabin. Draw the front together and glue in the firewall. Epoxy in the landing gear. Add the $\frac{1}{8}$ inch square bottom longerons, $\frac{1}{8}$ inch sheet nose fillers and $\frac{3}{32}$ inch plywood strut mounts. Add bulkhead "B" and $\frac{1}{16}$ inch sheeting between it and the firewall. Set the wing on the fuselage and glue the top windshield mount to the fuselage at an angle that allows a snug fit against the wing center section. Glue in the wing holddown dowels and $\frac{1}{16}$ inch dowel cabin supports. It all sounds harder than it is.

Cut out the $\frac{1}{4}$ inch balsa cowl ring and make up a length of $\frac{1}{16}$ inch balsa sheet 11 X 11 inches long. Wet the outside of the strip and wrap it around the ring. Glue it with the thin cyanoacrylate. Glue two $\frac{1}{4}$ inch square pieces in the cowl and add the $\frac{1}{16}$ inch dowel pins. The cowl is just a friction fit.

Bend up the tail wheel wire and epoxy it in. Wheel pants are $\frac{1}{16}$ inch sheet centers with $\frac{3}{16}$ inch sides. Shape them to a nice round cross section. Attach the $\frac{1}{8}$ inch landing gear fairings and reinforce with silk or nylon and epoxy. I was lucky with my wheels. A lot of weight can be saved here. I found some nifty lightweight plastic wheels from a Sig L-19 kit. Wooden rubber band model types work too. The more exotic (heavy) Williams wheels would be my "desperation" choice. Slide the pants (with the wheels in) on the axle and epoxy the pants solidly to the wire and fairing. A little gusset where the landing gear emerges from the fuse might be nice but I

FLYING MODELS





Jim used white tissue to cover the Monocoupe and sprayed on six coats of Sig low-shrink, clear dope for finish. Iron-on's may warp the frame



Though not exact scale, the plane serves its purpose of giving an impression of the appearance and charm of the original.

used some G.E. "Silicone" seal and trimmed it flat with a razor blade.

The struts are fabricated from stiff $\frac{1}{8}$ inch balsa. The $\frac{1}{16}$ inch wire mounts are bound and epoxied to the appropriate ends of the struts. Epoxy the $\frac{1}{16}$ inch inside diameter aluminum tubes to the reinforcement blocks in the wings. Mount the wing to the fuselage and plug in the struts. Position the metal plate on the other end of the strut and bend and slide it until the hole lines up with the plywood mount in the fuselage. This end of the strut is held in place with a small sheet metal screw. Someone told me the wires should be in the wing and the tubing on the strut. If that is more appealing, go ahead. I have found I'd rather re-epoxy the tubing to the wing than fix a strut or tear in the covering. In any case don't omit the struts. They look great.

Finishing

Sand everything smooth with 400 paper and let's cover it. Iron-on coverings might not only turn the "Coupe" into a pretzel but would destroy the character and intent of the model. However, there may be one exception. I've used Coverite's "Micafilm" on an Old-Timer and most people swear it was silkspan. It's exceptionally light and isn't too tough to work with. The only difficulty is paint won't stick and sticky film appliques will have to be used for trim.

I covered the whole thing with white tissue, adhering it with thinned Elmer's glue. Six coats of Sig low-shrink clear later produced a really nifty job. Tracing paper stencils for the scalloped trim were then cut out and attached with thin rubber cement. A thin coat of red was airbrushed on. Rapidograph control surfaces and doors add a nice touch. Glue on the windshield and cabin windows. In thirty years I still haven't learned to be patient and do this well. Mix up a little surfacing resin and paint the inside of the cowl and firewall.

File a slot in the top of the needle valve so you can adjust it with a screwdriver. Now mount the engine and install your radio gear. Pay attention to the center of gravity.

Let's go flying

Don't leave home until your engine runs flawlessly and dependably. More nifty planes have been ruined by a desperate pilot launching a poorly running engine only to tip stall

in or hit something because the plane is wallowing, not flying. Initial flights are without the cowl. A 5 $\frac{1}{4}$ -3 prop and no cowl is a good starting point. Later the cowl and a 6-3 prop calms things down considerably.

Well, how successful was this whole project? For me the investment in time and money was one with a big return. The finished product has all the charisma and appeal of the actual plane and the era it personifies. What about the important aspect . . . flight? The plane has two distinct personalities. Minus the cowl and a screaming engine it is a snappy performer that will roll, split-S and sometimes loop with the best of any rudder only planes. With the cowl and big prop a relaxing performance will be realized. Shortcomings? Sure, it has some but they're a trade-off. For instance if you hit the smooth dirt on the ball diamond nothing is prettier than a slick wheel landing with those pants and fairings reaching for the ground. Miss

the spot and those same pretty wheel pants and grass can produce a routine worthy of an Olympic gymnast doing her floor exercises. Sure, tissue and dope has an appearance that can be duplicated no other way but sharp branches and sticks do interesting things to it. I just don't fly where they're a problem. The struts do much for the whole plane appearance wise. Occasionally you'll crack one or tear a fitting loose but Hot Stuff™ makes that no big deal. Often I wonder about a Cannon radio and a Baby Bee screaming its heart out, or, no radio at all. 15 seconds of fuel, an endless green field, blue skies, bursting lungs, knotted leg muscles and barbed wire fences. As it slowly glides by flaunting its very pretty shape with sunlight sparkling through the covering you'll love it!

By the way Do you want to know what my Dad bought me for my birthday at that magic age of twelve? A Wasp .049 and De-Bolt All-American profile. ☺



A penny for your thoughts. Pat is this a look of admiration or resignation? We won't tell but the plane certainly can be admired for its performance with either a screamer or a big prop on the front.