Almost everyone who has worked with high-performance model engines knows who Bill Wisniewski is. He's been a prominent engine designer and CL Speed flier for years. Twice he has won the gold in FAI Speed World Championships. We're privileged to help Bill share his know-how in this interesting class.

Bill Wisniewski

Pink Lady Formula "40"

CREATED TO DRAW people who fly Rat Racers and other Control Line Racing events into Speed, the Formula "40" Speed class is an easy event to fly. It epitomizes the virtues of simplification. There are no takeoff dollies to build and chase. The fuel is supplied at the contest. The only restrictions on the design of the airplane or engine are that it must have at least one wheel permanently attached and that the engine displacement must be no larger than 6.6 cc (.4027 cu. in.).

The fuel supplied is mixed to a standard formula of 40% methanol, 40% nitromethane, and 20% lubricant. The choice of lubricant is left to the organizers. The lubricant I use is three-quarters synthetic (K&B X2C or Klotz) to one-quarter castor (Bakers AA).

The clocking of the airplane is for one mile from takeoff. That's 14 laps on 60 ft. of .018 solid music wire control lines (see figure 2 of the AMA rule book, page 19, for construction of the ends).

Acceleration is very important, so a light airplane is essential. In order to minimize the effect of engine torque, which is considerable in the racing .40 engines, I choose to fly this airplane clockwise around the circle instead of in the usual counterclockwise direction. This also eliminates the need for tip weight in the wing.

You will notice that the landing gear is bolted on top of the engine head. This has two advantages: It puts the wheel ahead of the center-of-gravity and it also acts as a heat sink for better engine cooling.

Top: With a shape that resembles an inverted Class B Speed ship, this model makes a great vehicle for starting out in the world of Speed modeling. Above: Designer Wisniewski shows us his design to win races with and hopefully reinvigorate CL Speed.

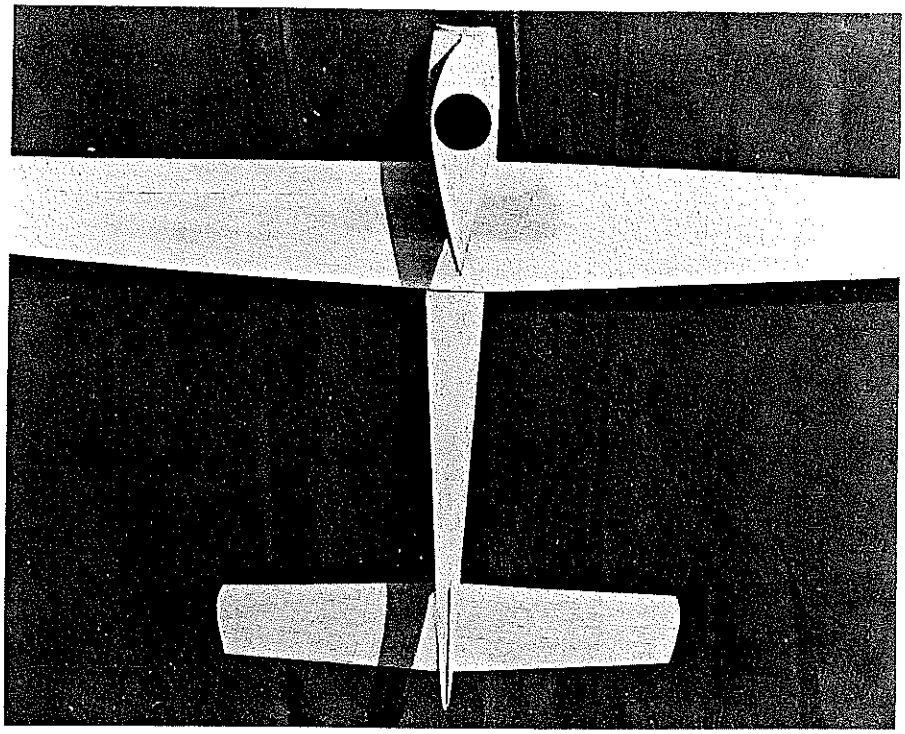
This Pink Lady was developed from our Class B Speed model, which is why it looks like an inverted Speed job. With a K&B 6.5 engine, the model's weight comes out at 22 oz.

Construction. I usually start by making the hardware (landing gear, bellcrank, elevator control horn, fuel tank, and pan). The landing gear may be made either of two ways. It may be fashioned from a piece of angle extrusion of hard aluminum alloy 3/32 thick, or it may be bent from sheet material. Drill the holes per the dimensions on the drawing. The axle is machined from 1/4-in.-dia. steel bar.

The bellcrank is cut from 1/16 steel sheet. The hookup buttons and pulleys are machined from 1/4-in. steel bar. Note that the buttons extend through the bellcrank and are silver soldered on the bottom of the bellcrank.

The elevator control horn is made from the same material as the bellcrank and is silver soldered to a piece of 1/16 piano wire.

The fuel tank is made from .010 tinplate (from a fuel can or K&S). Note that the fuel pickup line is soldered to the outside of the tank and then drilled through from the inside.

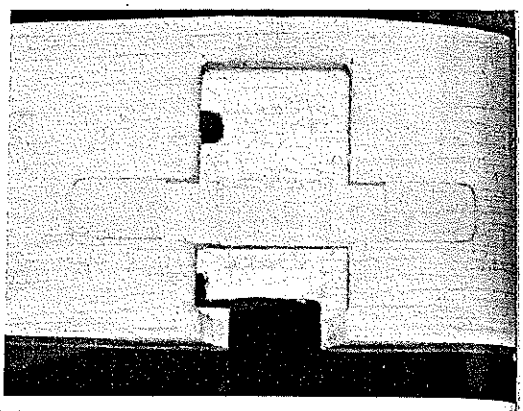


The cut out and assembled lumber, ready to be shaped and streamlined. Lightness (for quick acceleration) is a key element in this type of flying, so avoid any unnecessary weight.

A Harter's Proto, Rat Race pan is used, but is cut off on the front at the first rib to accommodate the 1½-in. spinner. Remove the other web to make room for the engine. Drill and tap the engine mount holes and the screw holes to hold the airplane together. Note that there are five screws holding the pan on. Drill and slot the needle valve hole. Be sure that the needle does not touch the pan. Cut off the back of the pan as per the drawing.

Fuselage. Cut two pieces of maple or white mahogany ¼ x ½ in. to make the crutch. Lay out the inside part of the crutch, and cut it out. Glue the crutch pieces to ½-in. balsa sheet using a good slow-setting epoxy that is compatible with polyester, such as Sig or 3M #1838 B/A.

Make the nose ring either from ¼-in. five-ply plywood or by laminating two pieces of ⅛-in. plywood together. Glue the nose piece to the front with the same epoxy.



Inlay the bellcrank mount (made from rock-hard maple) into the simple sheet wing for a solid surface that will withstand the high Gs.

After this is dry, cut the wing and stabilizer notches, then drill the pan mount holes and a 1½-in. hole for the engine cylinder.

Cut away the inside to clear the engine. Bolt the pan to the airframe and lay out the outline of the exterior. Cut the outline of the fuselage.

Make the upper part of the fuselage from balsa, cutting a $\frac{1}{16}$ slot to accommodate the rudder. Tack glue the rudder to the bottom.

Lay out the outline of the cowl. Carve the contour of the fuselage to fit the pan and cowl outlines. The aft part of the fuselage is oval in cross-section. Remove the top and carve the inside to leave about ⅛ in. of wall. Cut away to clear the control horn and clevis link.

The cowl is cut from a piece of soft balsa, 1½ x ¾ x 6 in. Drill a 1½-in. hole for the engine cylinder and a $\frac{15}{16}$-in. hole for the mini pipe. Cut away the inside to clear the engine.

Lay out the outline of the cowl and cut to

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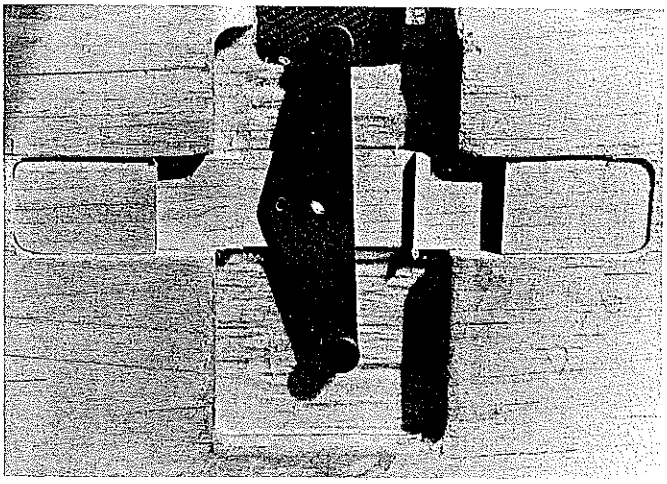
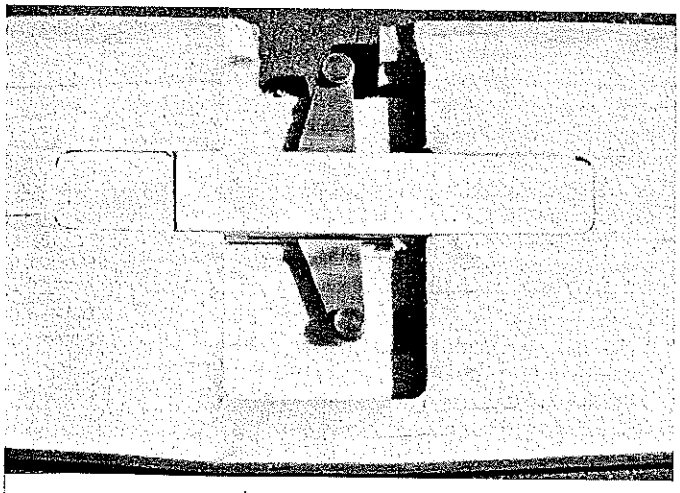
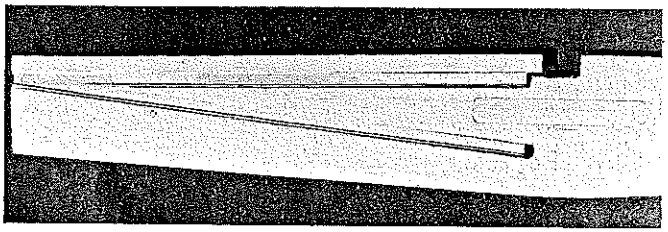
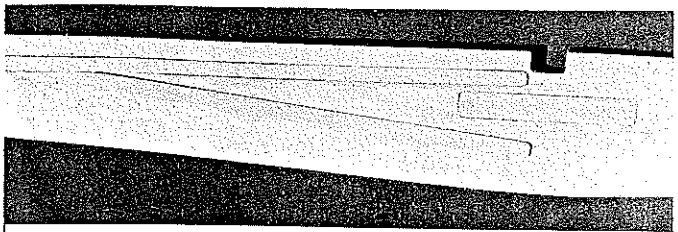


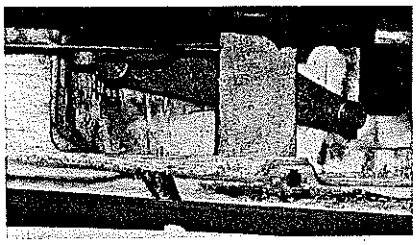


Left: The bellcrank will be located as shown here, then pinned into place. Right: Once secured the top bellcrank mount is glued into place using slow-cure epoxy. Before the epoxy sets, make sure there is no binding and that there is plenty of room for the bellcrank to move.

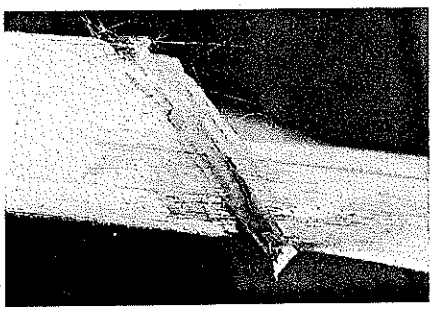




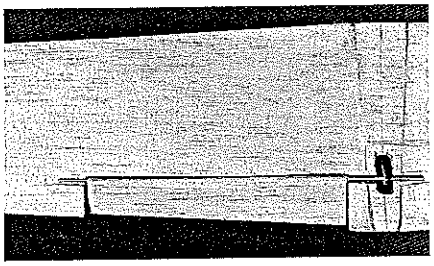
Left: Cut grooves into the wing so that the control lines can be imbedded, then coat the grooves with polyester resin to make them smooth and hard. Right: After the polyester resin cures, cover the grooves with strips of balsa, and glue them into place with polyester resin.



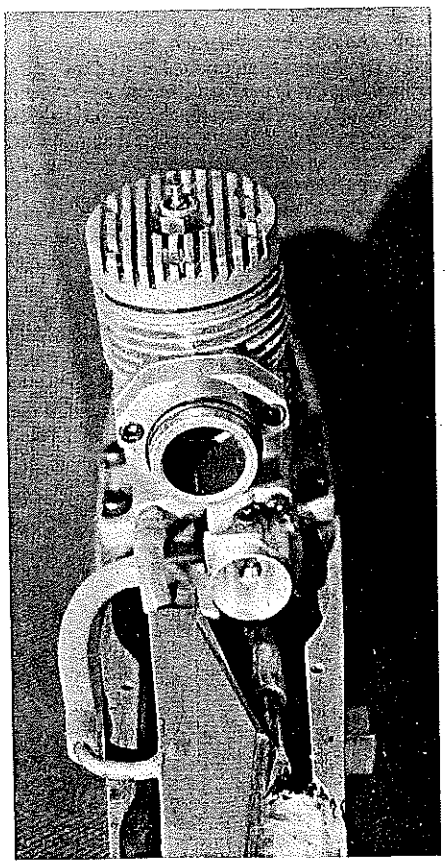
Once completed the bellcrank installation should fit snugly inside the model, yet move freely without binding or any sloppiness.



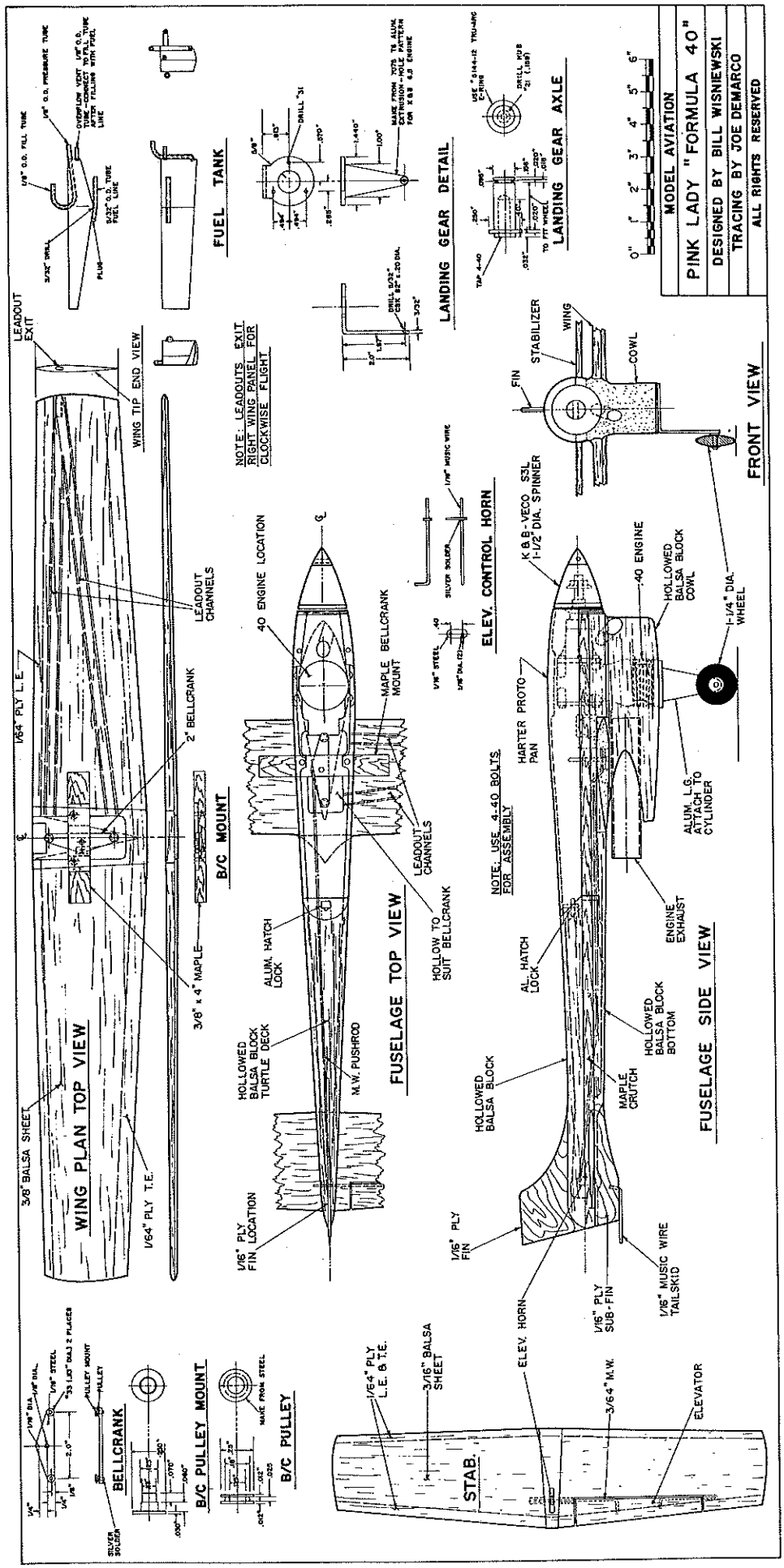
Reinforce the rear fuselages joint with pieces of fiberglass roving to prevent splitting.



Elevator installation prior to filling the hinge cavities with epoxy. (Don't forget to wax the hinge points, or you'll have just a stab again.)



The fuel tank (see plans for details) fits snugly inside the pan and is held in place with silicone glue. Notch the fuse to clear all tubes.



under the title, "25 Years Young." Today it could be called 47 Years Young.

During the 1970s Joe built an RC demonstrator to show non-modelers how an RC model works. It consisted of a cutaway RC model with four control functions. Connected to the demonstrator model via an umbilical cord was a transmitter with its circuitry removed and a special closed-circuit system to operate the servos. He could bring this demonstrator to all the local contests and let the invited public try their hand at operating the controls without any danger to the contestants who were flying.

Joe attended every local meet that he could, bringing his demo with him and showing the crowd of spectators how an RC model works. No meet was complete without Joe and his demo. Contest Directors would call him when planning a meet to make sure that Joe could attend. This continued until his death.

This effort on Joe Raspante's part contributed greatly to enhance the image of RC modeling with the general public. Thus it was of great service to modeling and the AMA. We have all suffered a loss now that he is no longer with us.

Pink Lady/Wisniewski

Continued from page 62

shape. Laminate 1/64 plywood on the outside using gap-filling Hot Stuff cyanoacrylate adhesive. Spray the balsa with accelerator. Spread the adhesive on the plywood and press on the balsa. The bonding is almost instant, so position carefully. The cowl base is a piece of 1/8-in. balsa that extends from the front of the cowl to the leading edge of the wing.

Wing. Use a piece of 3/8-in. balsa to make the wing. Taper the bottom of the wing to 3/16 in. thickness at the tips, leaving a flat portion for the cowl mating.

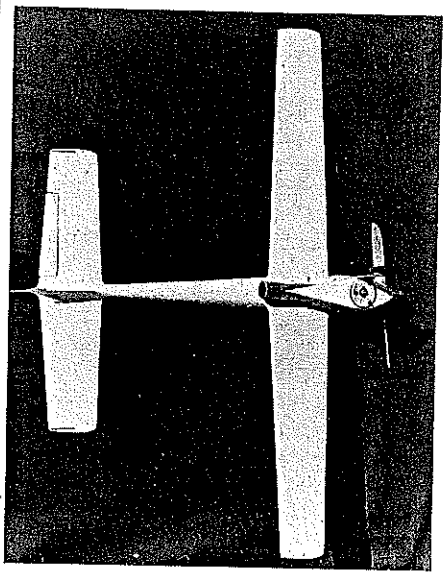
Cut the outline of the wing. Cut a .020 x 3/8-in.-deep groove at the leading and trailing edges, parallel with and 3/32 in. from the bottom of the wing. Fill these slots with 1/64 plywood and glue with thin cyanoacrylate adhesive. This gives a hard line for shaping the airfoil.

Cut the bellcrank mount from hard maple, but do not glue it to the bellcrank yet. Cut the wing to accept the bellcrank mount and clear for the bellcrank. Cut the grooves in the bottom of the wing for the lines and the caps to cover them. Seal the grooves with polyester resin. The tip guide for the wires is made from a piece of 3/16 brass tube, flattened to 3/64 inside dimension using some short pieces of 3/64 wire. Glue in place using slow-setting epoxy. Note that both lines go through the one tube.

Shape the airfoil, giving it a lifting section in the center but making it symmetrical at the tips.

Glue the bellcrank mount in place. Note that the wing is left flat where it joins with the fuselage and cowl. Cover the wing with two-ounce fiberglass using polyester resin. Drill the two pieces of bellcrank mount 1/8 in. for the bellcrank pivot. Glue the bellcrank mount pieces together with slow-setting epoxy. The bellcrank should be put in place before gluing. Be sure you can remove the pivot pin so that the pushrod can be installed.

Stabilizer. Use 3/16 balsa sheet. Cut the out-



Note the clever landing gear installation our author used. Not only does it have low drag, but it also acts as a heat sink for the engine.

line of the stabilizer. Cut a .020 x ⅜-in.-deep groove in the leading and trailing edges and in the center of the 3/16 thickness. Fill the slots with 1/64 plywood and glue into place as with the wing.

Shape the symmetrical airfoil, leaving the center flat where it joins the fuselage.

Cut the elevator from the stabilizer. Drill 1/16 and 1/32 holes for the control horn and end hinge-pin. Groove the elevator so that the control horn wire and hinge-pin wire fit flush. Glue in place using slow-setting epoxy.

Cover the stabilizer and elevator with two-ounce fiberglass using polyester resin. Be sure to wrap the glass around the elevator.

Cut the pockets in the stabilizer to accept the control horn wire and hinge-pin. Cut to clear the control horn. Wax the control horn wire and hinge-pin using a good paste wax. This will form the hinges when slow-setting epoxy is used to fill the pockets and cover the wires. When set, file or sand the epoxy flush with the stabilizer and cover with small pieces of two-ounce fiberglass.

Assembly. Prior to assembly, seal all inside areas with polyester resin. Make the push-rod from 1/16 music wire. Make the rudder and tail-skid mount from 1/16 plywood and glue in place using slow-setting epoxy. Clear the control horn area for the solder "quick link."

Install the pushrod in the bellcrank and replace the pivot pin. Cover the ends of the pin with two-ounce fiberglass using slow-setting epoxy to retain the pin.

The wing and stabilizer are connected together using the solder "quick link" to establish the elevator neutral setting while sitting in the fuselage notches. Glue the wing and stabilizer in place using slow-setting epoxy. Be sure to maintain a zero incidence between wing and stabilizer.

Glue the rear pan mount into the back of the fuselage. Disassemble the engine and mount the crankcase in the pan. Wax the pan so that the glue from final assembly won't stick to it. Wrap three layers of masking tape around the crankcase fins. Bolt the fuselage to the pan after drilling the mount holes through the wing.

Glue the cowl in place. Glue a piece of 1/8-in. aluminum in the upper fuselage to act as a rear hold-down. Drill and tap this in line with the holes in the pan for a 4-40 screw.

Finish shaping the fuselage and sand smooth. File the notches in the fuselage near the break at the pan using a small, round file. Do not file more than 1/16 deep. Fill these notches with strands of fiberglass and polyester resin. File or sand smooth.

Install the fuel tank in the pan using silicone rubber (RTV). Notch the fuselage to clear the fuel-filling tubes. Seal the entire fuselage with polyester resin. Sand smooth.

Cover all seams and fillets with two-ounce fiberglas and polyester resin. Sand smooth.

Drill the air supply hole through the cowl

and fuselage. Seal with polyester resin.

Mask the inside areas of the fuselage. Spray or brush two coats of K&B Super Poxy primer on the whole airframe. Sand almost all of it off using #320 sandpaper. Spray a tack coat of color K&B Super Poxy paint, then a flow coat. To keep the weight down, use no more paint than absolutely required. Don't forget to put your AMA license number on the upper right-hand wing.

The engine is modified as follows. The exhaust port is raised for approximately 60% of its width to a 176° open timing. (Stock timing is 165°.) This involves filing it up .035 in. The rotary valve is set at .003-in. clearance to the backplate. The cylinder head is also set at .003 in. from the top of the piston when the piston is at top dead center. Flatten the top of the head to give the landing gear a place for mounting. The spinner is an old Veco or K&B 1½-in. needle nose spinner (#S-3). I believe Fox Manufacturing owns the dies for these.

The propeller used is an 8-in.-dia., 8¼-in.-pitch Rev-Up cut from an 8¾ x 8½-in. Pylon Racing prop. I have had good results from an 8-in.-dia., 9-in.-pitch Rev-Up Rat Race propeller also.

Flying. Putting this plane into action is pretty easy once you get the knack of flying clockwise. The starting procedure is as follows. Open the needle valve five turns. Holding the plane nose-up, fill the tank with one ounce of fuel. This will not completely fill the tank. Do this on the flight circle, and to avoid flooding the engine do not set the plane down or point the nose down. Start the engine and let it go as soon as possible. It will probably be too rich, so a few test flights might be required to find the optimum needle setting.

Hope you have as good a time with the Pink Lady as I have.

CL Aerobatics/Fancher

Continued from page 64

ball? Or how about the infamous Di-Do biplane, flown by Howard Thombs (*He was the first winner of the Walker Cup, I think. Seems I don't have the Cup around anymore or I'd look it up for sure . . . Can't figure out where I lost that thing . . . Ted*), usually, who took off, flew a lap or two, and then put the handle on the ground and stepped on it while the model simply looped until the tank ran dry!

"You never see glider pickups any more, nor circle-drawing (done on blacktop with a piece of chalk attached to the top of the fin via a short length of ⅜-in. square balsa), nor steeple-chasing over and under obstacles.

"I think the reason that all forms of model flying have lost popularity is the overemphasis on rigid adherence to specific rules. We have to conform too much already. Doing what our teachers, supervisors, law enforcement people, Infernal Revenue Service, etc. tell us to do . . . and how to do it, and when . . . and where! That's why (to me, anyway) it's so enjoyable to get out and fly my own kinds of models in the way I happen to feel like flying them. I don't need trophies to prove that I'm having fun!"

Following a letter from me, begging for some elaboration on Joe's fascinating history in the early days of Stunt and his involvement with the Veco Company, I received the following letter (which I've edited slightly):

"Dear Ted, Here's the background on the Veco U-Control models you asked for.

"In the beginning, there was the Burbank Manufacturing Company, organized by Hi Johnson and Bob Palmer in the latter part of 1947. They eventually produced a series of four Control Line kits: Palmer's Go-Devil in "Sr." (.60-powered) and "Jr." (.29-powered) versions, and J.C. ("Madman") Yates' Madman, also in a large and small version.

"J.C. was not an active partner in the company, inasmuch as he was tied in with Hank Orwick in the Y&O propeller business. Anyhow, sales were pretty good, although limited almost entirely to the West Coast. Then, just when things were going well, Bob caught his right hand in the die-cutting machine and lost all the fingers from that hand.

"This accident put a bad crimp in the company's activities, mostly from the morale standpoint. Then along came Gilbert Henry.

"Gil was never a modeler, but he knew there was more money to be made in the hobby field than in the immediate postwar aviation business. Not long after V-J Day he bought out the old Voit Model Airwheel business, moved it into a small shop in Burbank, CA, and thus began the *Heco* Company. (Yes, Heco . . . for Henry Engineering Co.)

"He was doing OK by 1948 when he learned that: 1) The Burbank Mfg. Co was in trouble, and 2) Ricks Mfg. Co. (makers of ukie models such as the Boxcar and Dilly) was in trouble. Gil managed to put together a deal with Hi Johnson