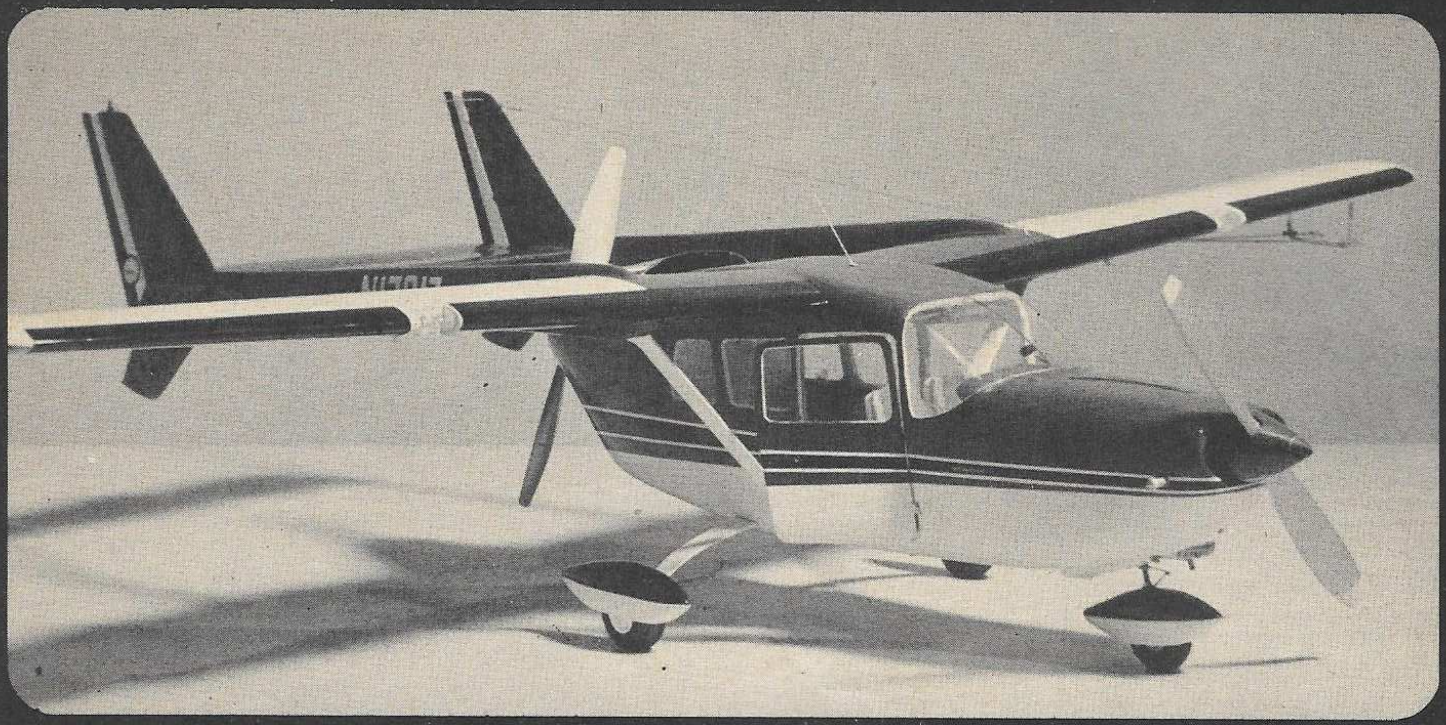
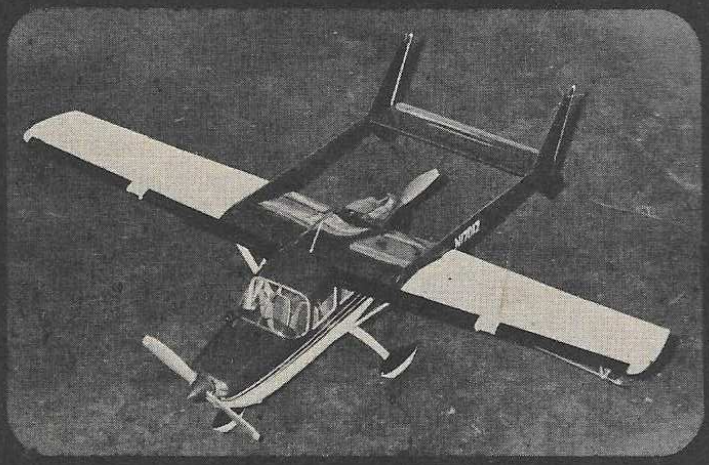




Championship Winning Cessna 336 Skymaster

One of the most interesting businessplane designs of recent years, the Cessna 336 Skymaster is a marvelous subject for twin-engined models. Unlike other twins, its "center line thrust concept" with push-pull powerplants permits a minimum of upsetting forces after one engine conks out. F/F and R/C fans alike should be enthusiastic over Cessna's center line thrust concept, as CLTC craft continue on course relatively undisturbed after one engine has quit.

After ribs and spars are cut out, assemble wing spar with aid of spar braces. Dihedral should be as shown. Ribs are cemented to spar first, then ¼" sq. balsa L.E. and ⅛" sq. ply T.E. If a power saw is not available for stripping up ⅛" ply for T.E., ⅛" pine or spruce will do the job. Flap control horns should be formed and installed at this stage (before top sheet covering). Aluminum straps about 1/16" x ⅛" are used, being wrapped around the control horns and T.E. Cover the bottom of the wing with 3/32" sheet (be sure this is done before mounting bellcrank or flap-actuating "L"-crank.

After bellcrank and L-crank are installed, make inclined lead-out holes in wing bottom. Cement ⅛" O.D. tubing in these holes to minimize wear due to lead-out wire movement. To make an easy job of mounting the booms and stabilizer, make push rod 8" long initially. When tail booms and stabilizer are in place, remaining push rod length is soldered on. Secure front end of push rod to bellcrank with washer soldered to push rod end. Check actuation of bellcrank for smoothness, then plank top of wing, add tip blocks, ailerons and flaps.

Cut four blanks for tail booms from ¼" sheet, working as accurately as you can in cutting the wing opening. Careless work at this stage can result in one boom drooping more than the other—nothing looks worse in a twin-boomed job! Boom cores of ⅛" sheet (2) are needed, plus a pair of rudder supports cut from ⅛" ply. Note that clearance for the push rod is cut out of the inboard support. Flyers who prefer the standard counter-clockwise flying direction will want to hollow out the left boom for push rod clearance.

Only the outboard ¼" blank is cemented to the ⅛" core of the left tail boom—access is needed for subsequent push rod installation. In laminating the right boom, do not forget rudder support. It is very hard to install in the assembled tail boom. Carve and sand tail boom as per section. Cut rudders from ¼" sheet, carve, then sand to airfoil section. You may have to splice sheets to complete the rudders, but seams will easily be hidden with filler later. Rudders are cut out to accept ply supports—when rudders are cemented in place, cut out areas are replaced and sanded flush. Stab and elevator are cut to match plans and are hinged together and sanded to airfoil section (note dotted lines in side view).

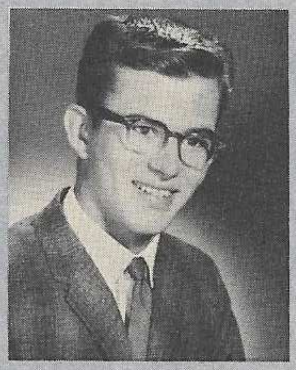
Cut out fuselage sides, window frames and bulkheads as per plans. If an operating door is desired, cut two from 1/16" ply and cement together. The operating door goes hand in hand with interior detail, as some access will be necessary to perform various last "touches" interiorwise. Cement ⅛" ply side window frames to fuselage sides and let dry completely. Assemble nose gear and bolt to firewall (bulkhead B). Upper portions of bulkheads D and E are ⅛" ply to strengthen engine bearer anchorage. Both D and E are cemented to fuselage sides with all bottom edges flush. Note ¼" sheet sides where fuselage curves in at bottom of E. Cut ⅜" x ½" engine bearers to size and cement in place. Fill spaces between engine bearers and fuselage sides with balsa. Let cement dry thoroughly before attempting any carving or shaping.

Notice the odd shape of the fuel tanks. Space is at a premium in this job, so they have to be custom-made to fit as shown. No overflow system was deemed necessary—just a feed and filler line per tank. Our tanks were made from coffee can stock and were cemented in place very securely to prevent them from working loose later. This is a good stage to add the various interior cabin braces. The cabin floor is 1/16" ply and butts into cabin sides. Floor outline can be traced from full size top view (don't forget to deduct thickness of cabin sides). A light score mark across the floor is needed to crack it upward slightly fore and aft, as only the area near door is horizontal.

Note the corner strips or longerons in the lower cabin sides—they are needed for strength. L.G. mount of ⅛" ply is fitted to bottom of floor. Formed dural L.G. strut is bolted to it. To keep engines clean during sanding operations, tape them up, being careful to seal the intake and exhaust ports. Mount both engines and cut intake holes in fuselage where needed. Start at nose and work back hollowing and cementing ½" sheet blocks in place. Bend air scoop and cowl flaps from tin. Carve fuselage to shape and sand. If windows are added now, mask them off to prevent scratching, as there will be much handling yet before we are done with fuselage. Cockpit detailing can be as basic or frilly as you choose and should be done at this stage. For those looking for pix of interior set-up—see pages 80 and 81 of *Air Progress*, June 1963. This issue had a full flight report and plenty of exterior pix of the prototype, plus factory 3-views.

Assembled wing is cemented to fuselage, visual checks being made to verify proper alignment. Top blocks are contoured and cemented in place—be sure to hollow out the ceiling area over seat first, as that is hard to do after assembly. Cement tail booms to wing and stabilizer between booms. Bend aft end of push rod to connect with 8" stub previously fitted, slide tubing on to fit overlapped ends of push rod and solder. Don't absent-mindedly overlook the fact that bellcrank and elevator should both be neutral when soldering push rod joint. Cover in-

Seventeen year old Patterson, California control line scale designer wins senior Nationals honors with beautiful miniature of a new twin-engine plane featuring push-pull powerplants. He belongs to the Tracy Skyliners club.

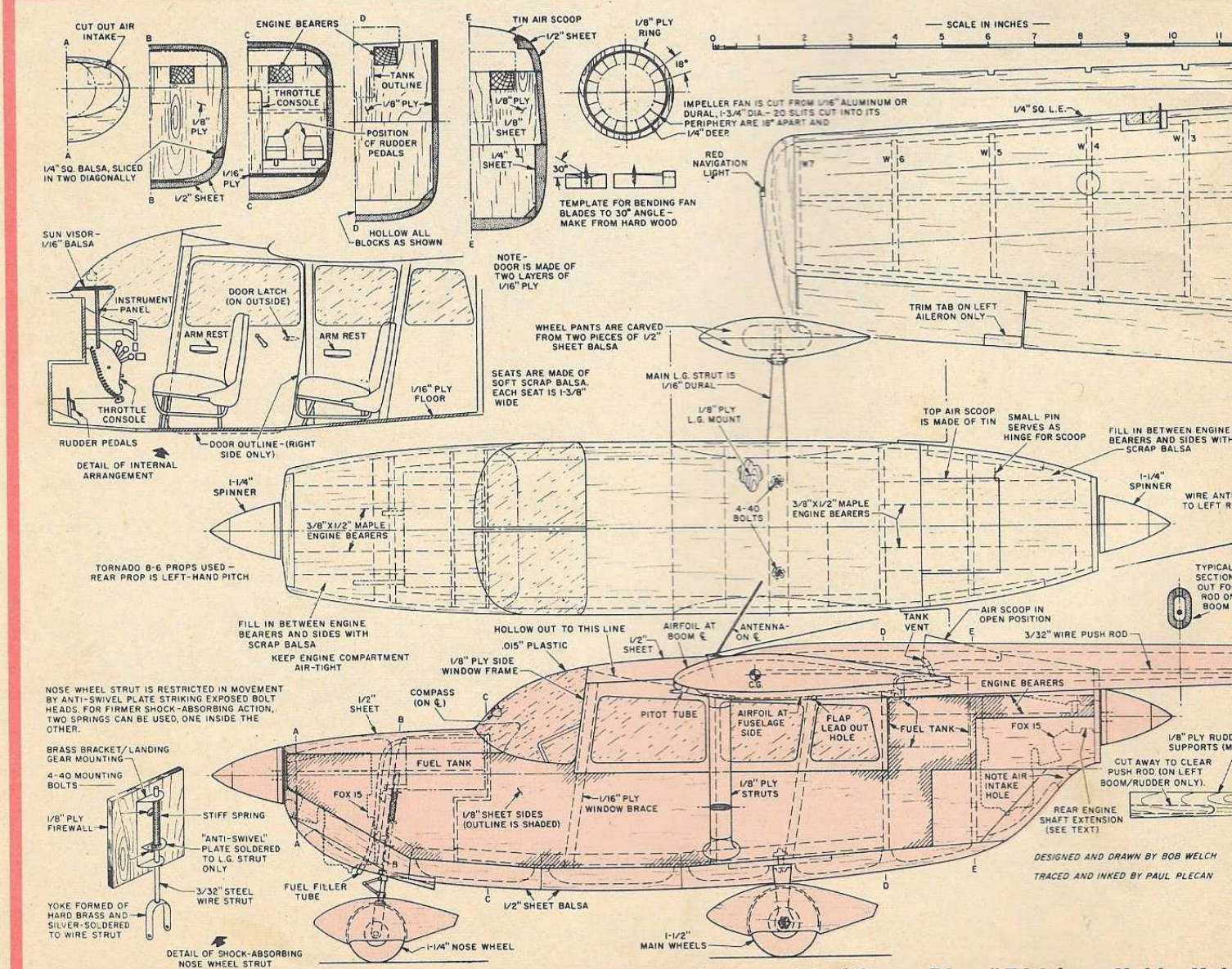


BY BOB WELCH

board boom with piece previously left off and carve to proper shape. Make fan as per plans; in order that all blades be bent at equal angles, be sure to use hard wood jig shown. Fan hole should match diameter of pointed pin in template or jig (1/16" is a good size), later drilled to match engine shaft diameter.

Wheel pants are carved, hollowed and fiberglassed to nose wheel strut and main (sheet dural) L.G. strut. Make small fairings for outboard faces of rudders, cement in place. Use your own judgment in cutting cowls—but you can profit by my experience. I cut them out after the model was judged, which was not too good, as I didn't have the right tools at hand and could have done a neater job at my workbench. This is not likely to be anybody's first scale attempt, so the finishing procedure will not be detailed. I recommend covering the entire fuselage with nylon and using enough primer-surfacer to hide all scratches, wood pores and blemishes. I hope you have a strong sanding arm—you'll need it. Six coats of pigmented dope should provide ample body and a trip to the local airport will give you ideas for color schemes.

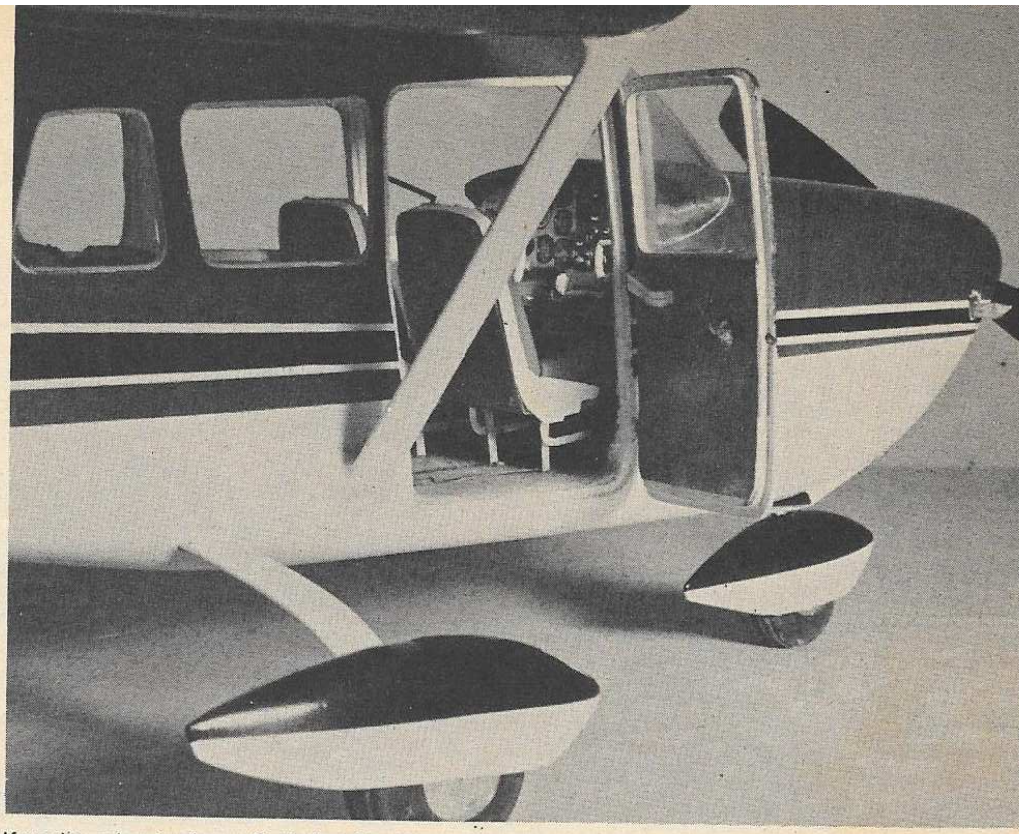
Finished model should weigh about 3 pounds. Model should balance at point shown in side view before



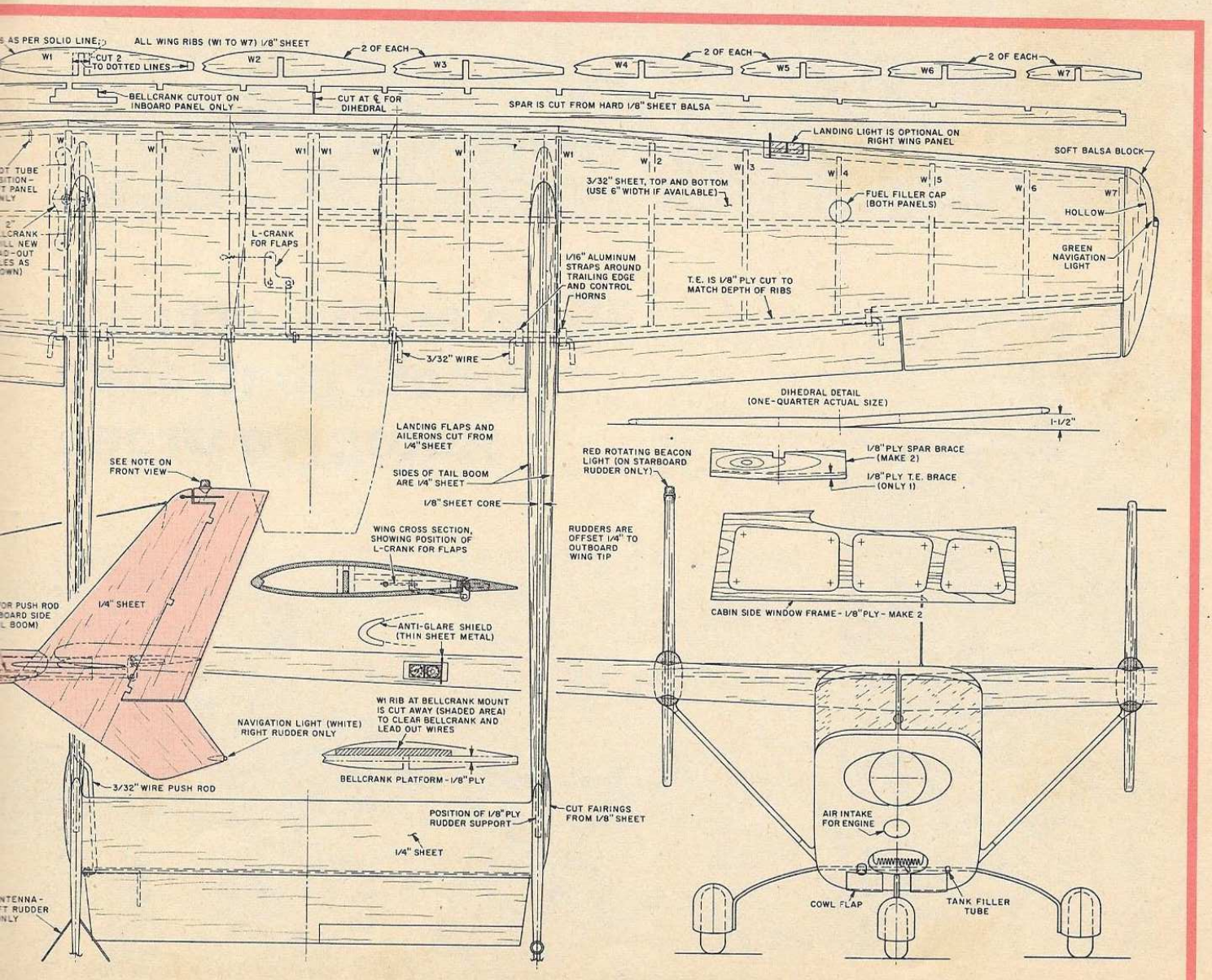
Full size working drawings for Welch's push-pull Skymaster are part of Group Plan #764 from Hobby Help

flying. Standard flying lines are recommended: .015″ dia., 52′ long. If you intend operating the flaps and throttles, the third line should be .012″ dia., stranded. Start rear engine first. It will be necessary to start rear engine from underneath, this being the easiest way to flip the prop without whacking off the tail. You should take off with a little down flap and up elevator, as the model rolls along level and needs to be gently coaxed into a slightly tail-down attitude before you see daylight under the wheels. The original model has made ¼-lap take-offs, but do not horse it right off—yours might need a full lap to lift off properly. Once in the air, it should almost fly itself. When the front engine quits after 15 or 20 laps (that's how the original model behaves, anyway), you can set it down or fly along on rear engine. I do not recommend extended flying with rear engine only as it tends to overheat and the glide ratio isn't too good.

(*Continued on page 74*)



If you're going to show off all that fine interior detail you'll need a working door. Extension shaft for rear engine is lathe turned and detailed in Bob's article.



Cessna

(Continued from page 19)

You'll undoubtedly want to know about that rear extension shaft, so here's the info. It is lathe-turned, a scaled-down version of the Veco extension shaft (Cat. #110). Original was cut down from two Veco prop spinner nuts. Engine shaft is thus extended ⅝" so engine is fully enclosed. If no lathe is handy, move rear engine back ⅝" and cut away lower cowl to clear exposed portion of cylinder. It won't look too bad, nor will it affect the balance of the model greatly.