PRAIRIE CANARY

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Designed By : Bob Wallace

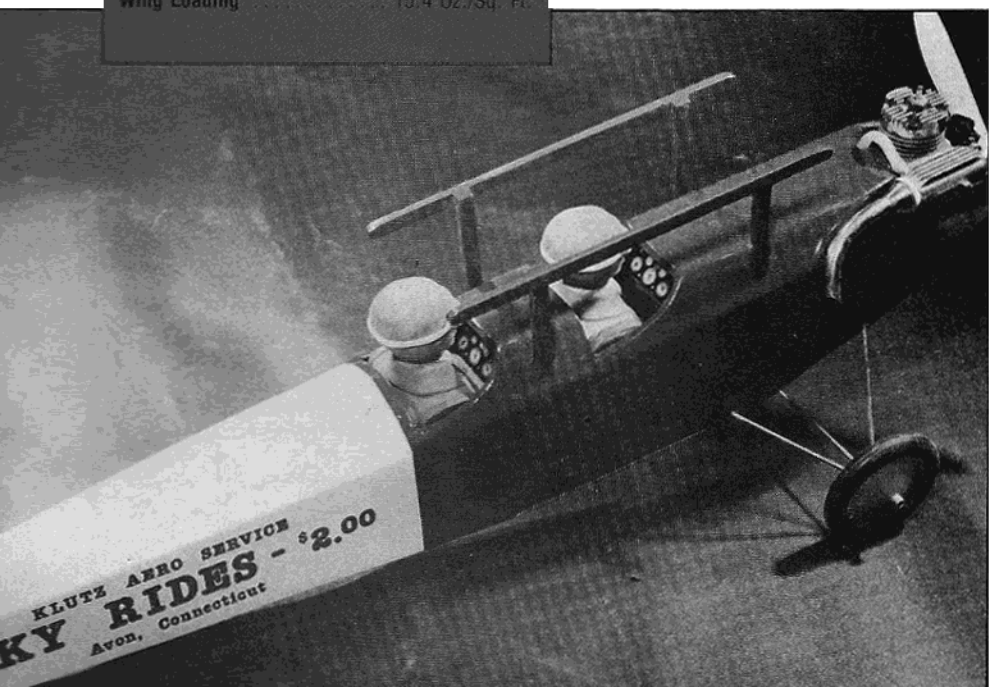
TYPE AIRCRAFT
Sport
WINGSPAN
36 Inches
WING CHORD
7 Inches
TOTAL WING AREA
252 Square Inches
WING LOCATION
Parasol Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Constant Chord
DIHEDRAL, EACH TIP
1¾ Inches
OVERALL FUSELAGE LENGTH
25½ Inches
RADIO COMPARTMENT AREA
(L) 5-5/16" x (W) 2¼" x (H) 2⅝"
STABILIZER SPAN
12¾ Inches
STABILIZER CHORD (incl. elev.)
4¾ Inches
STABILIZER AREA
60 Square Inches (Approx.)
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
4¼ Inches
VERTICAL FIN WIDTH (incl. rud.)
4⅜ Inches
REC. ENGINE SIZE
.049-.09
FUEL TANK SIZE
1 or 2 Ounce
LANDING GEAR
Conventional
REC. NO. OF CHANNELS
2 or 3
CONTROL FUNCTIONS
Rud., Elev. and Opt. Throt.
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa & Ply
Wing	Balsa & Spruce
Empennage	Balsa
Wt. Ready-To-Fly	27 Ounces
Wing Loading	15.4 Oz./Sq. Ft.

In aviation's short history the late 1920's and early 1930's bore witness to rapid proliferation and growth of homebuilt aircraft designs, several of which continue to this day to be popular subjects amongst the full scale aircraft building fraternity.

The era of the Pietenpol Air Camper, Heath Parasol, Corbin Baby Ace, Irwin Meteorplane, etc., is filled with nostalgia and offers the R/C modeler an extensive variety of designs to ponder. The Heath Parasol for example was one of the most popular designs of that period, yet virtually no two were built alike. Some of the less notable homebuilts of the 20's and 30's, illustrated the fact that their designer's engineering and building capabilities did not always match their enthusiasm to fly — a short coming for which they often paid the ultimate price. This colorful and zany period of aviation history is, to me, infinitely fascinating. If you share a similar interest in that era — read on — for the Prairie Canary is a composite of several older homebuilt designs. While it is not a scale model of any particular design, it does retain the distinctive look of a vintage homebuilt.

The Prairie Canary is easy and rapid to build; and demonstrates trainer like flight characteristics. To those virtues, add the economy of low fuel cost, small field capability, easy transportability; and you have an R/C design that spells "FUN."



Interested? If so rummage through your balsa wood supply, grab your X-Acto, and let's get into the construction details. The following construction details are laid out with the R/C modeler, who is building from plans for the first time, in mind. The experienced modeler will therefore find many of the construction steps and information to be of a redundant or unneccessary nature. In either case, it is recommended that you study and familiarize yourself with the plan before proceeding.

CONSTRUCTION

Wing:

Start by cutting out the wing ribs, you'll need twelve W2 ribs and six W1 ribs, all cut from 3/32" sheet balsa. Stack each group of ribs and pin together. Carefully sand the pinned together ribs to a uniform contour. (No matter how carefully you have cut each rib out, there will likely be minor variations in them.) Cut or file the main spar notches to the proper size. Cut 1/4" (as indicated on the plan) from the trailing edge end of four of the W1 ribs. Place the wing plan on your flat building board surface and cover it with wax paper or clear vinyl. Both wings can be built simultaneously. The trailing edge, main spar and leading edge pieces are cut to the proper length for each wing. Pin the main spars in place over the plan. Using several ribs placed temporarily on the main spars as spacers, pin the leading and trailing edge pieces in place. (The use of ribs as spacers will insure a proper joint when the ribs are glued in place.) The bottom 1/16" balsa center section sheeting is glued in place between the leading edges and the main spars. Note the position of the 1/4" square center section, trailing edge reinforcing pieces, and the angle to which they must be planed or sanded to allow for the top sheeting.

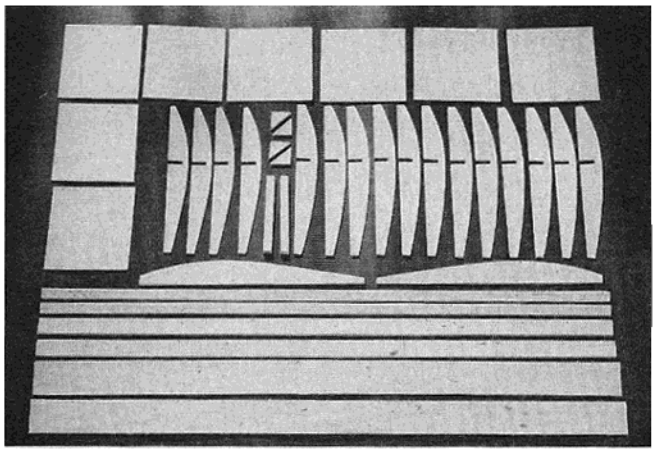
Install the 1/16" bottom sheeting between the main spars and the trailing edges. Glue the 1/4" square trailing edge reinforcement pieces in place. As the bottom sheeting now covers the center section rib positioning lines on the plan, use the small guide lines in front of the leading edge and aft of the trailing edge to properly position the center section ribs. The two center ribs should be angled slightly to produce the proper dihedral angle when the two wing halves are joined together. (An angle gap of

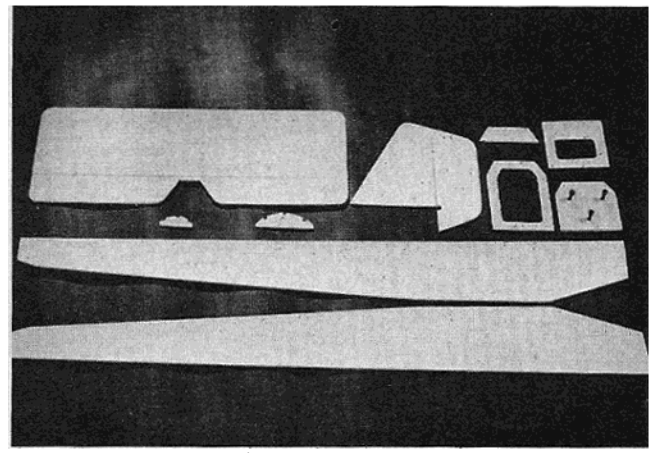
Color Photo by Lloyd Burnham

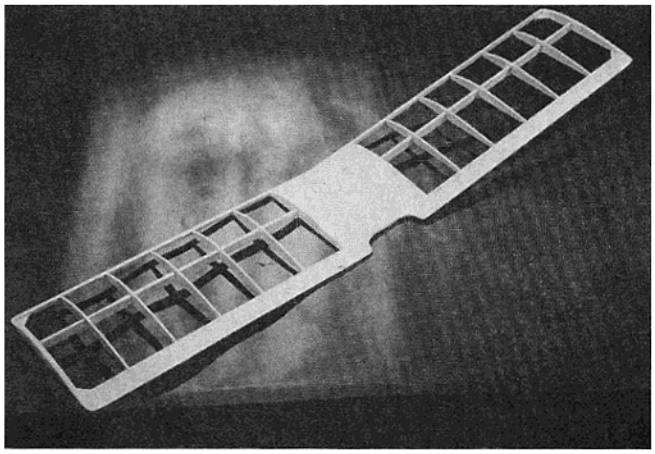
Designed and presented for the RC'ers first scratch-built model. It's easy and rapid to build, along with low fuel cost, small field operation and demonstrates trainer type flight characteristics. It all adds up to an RC design that spells "fun."

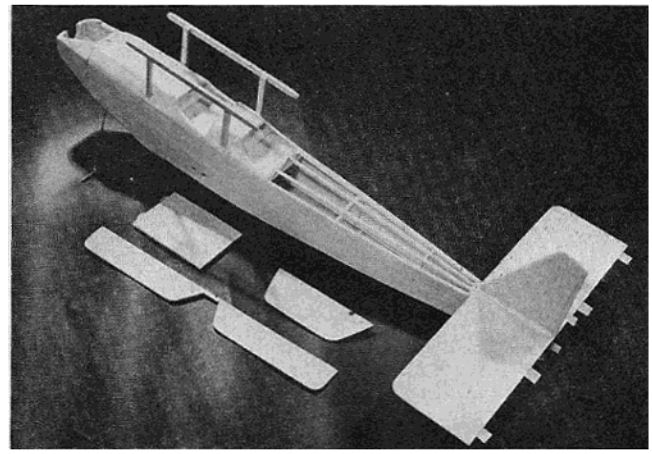
BY BOB WALLACE

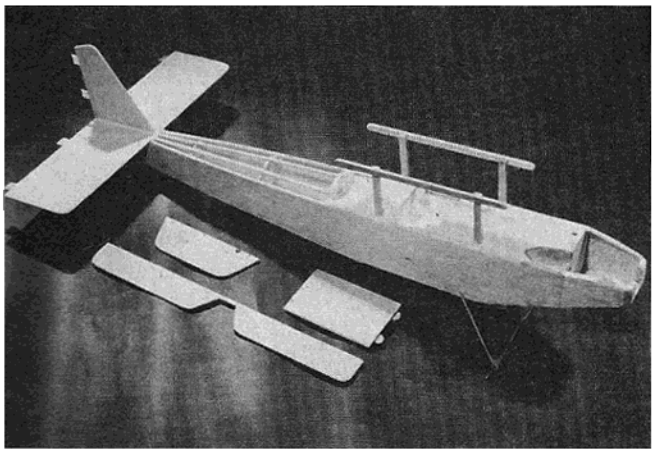
3/16" between the top of these ribs, over the main spar, is just right). Pin and glue all ribs in place. Care should be exercised in not gluing the two center ribs, sheeting, spars, and leading and trailing pieces together at the wing centerline. Glue the 1/8" sheet balsa gussets in place. After the glue has dried, remove the pins holding the center section ribs in place and glue the 1/16" sheet balsa top center section sheeting in place on each wing half. When dry remove the wing halves from the building board and glue the 1/8" sheet balsa tips in place. The wing leading edges should be carefully planed and sanded to the proper shape, as shown on the plan. The two wing halves are now joined by blocking up the wing tips to the indicated dihedral angle (1¾" each tip) and gluing them together. Use your building board for this step, to insure that the wing will be true with no "built-in" twist. When dry, remove from the building board. The entire wing should be sanded smooth. The center

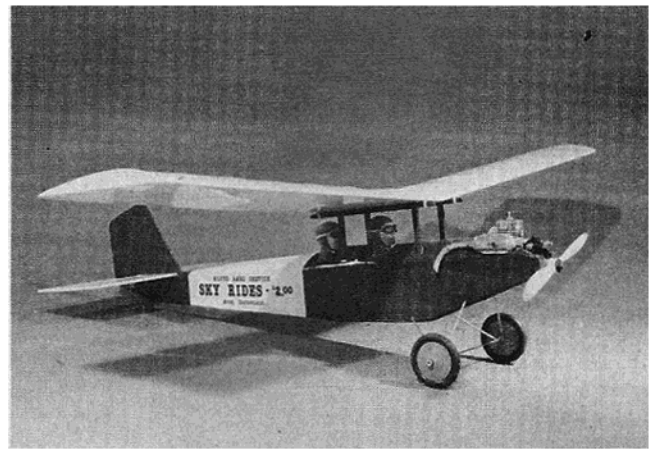












section joint should be reinforced by covering it with a 1" wide strip of 2 ounce fiberglass cloth and polyester resin. (Epoxy may be used instead of resin.) To do this simply coat the joint liberally with resin and lay the strip of fibreglass cloth in place. Gently smooth the cloth out and blot off the excess resin with toilet tissue or a paper towel. When the resin has hardened, the fiberglass cloth strip should be lightly sanded to remove any high spots or rough edges. The wing is now fine sanded in preparation for covering and set aside.

Tail Surfaces:

The tail surfaces are cut from 1/8" sheet balsa, as indicated on the plan. The two elevator halves are joined together by the use of a short piece of 1/8" hardwood dowel; which is glued in place, as shown, with both elevator halves pinned down to your building board to insure that they will be aligned properly. Cut the hinge slots. If you intend to cover the tail surfaces with a heat shrinkable film type covering, do not install the hinge now. It is far easier to cover the tail surfaces separately and install the hinges and control horns afterwards. A tighter hinge line (small gap) is then obtainable. This makes your control surfaces more efficient and also looks better. The tail surface pieces should be rounded on all exposed edges, as shown, fine sanded, and set aside.

Fuselage:

Start by cutting the fuselage sides out of 1/8" sheet balsa. Cut out all fuselage formers from plywood or balsa as indicated on the plan. Mark the location of the respective formers on the inside surface of the fuselage sides, lightly with a pencil. Lay a fuselage side directly on the plan over the fuselage side outline and glue the 1/4" x 1/8" spruce wing support pieces in place. This will insure that you have the proper wing incidence, built-in. Construct the wing supports on the fuselage left side directly over the right side. The vertical spruce pieces should be laid down first on top of the right side uprights, otherwise you will wind up with two right fuselage sides! Glue formers F1, F2, & F3 in place, being sure that each is square to the

fuselage sides. Glue the 1/8" x 3/8" lower fuselage reinforcement strips in place. (Note: be sure these strips are notched to accept the landing gear strips, before gluing in place.) Bevel the fuselage sides at the tail, as shown, and draw together and glue. Install the 3/32" sheet balsa cockpit floor, remainder of the fuselage formers, and cross braces. Use the fuselage top plan view as a guide to obtain a symmetrical fuselage contour. Glue the 1/4" triangle stock, firewall reinforcing pieces in place and drill the holes in the firewall (F1) for your engine mount and fuel lines. Bend the landing gear as shown on the plan and wrap and solder the axle attachment points. Attach the landing gear to LG1 an LG2 with either nylon fishing line or wrapping wire and epoxy. The landing gear assembly is now glued in place. The fuselage sides will have to be notched (about 1/4") to accept the landing gear wire and the plywood strips (LG1 and LG2) should fit into the notches which were cut previously into the 1/8" x 3/8" stiffening strips. Bend the 1/16" music wire tail skid and glue it in place using a piece of 1/8" sheet scrap as shown.

Glue the 1/8" and 1/16" balsa sheet fuselage bottom pieces in place. Cut and fit the 1/8" sheet access hatch in place. Glue the 1/16" plywood tabs in place on the hatch and glue the hardwood hatch hold-down block in place on F3. With the hatch in place, drill the small hole through the hatch and into the block to accept the retaining screw. (Use either a small wood screw or a sheet metal screw.) Glue the 1/8" sq. stringers, 3/32" sheet instrument panels and 1/8' sheet fuselage top pieces in place. The engine should now be bolted to the engine mount and installed in place on the firewall. Be sure to cover the exhaust, venturi, and fuel nipple to keep dirt and balsa dust out of the engine. The 1/4" balsa nose block and 1/8' sheet balsa cowl pieces are now glued in place around the engine. When dry, the fuselage should be shaped as shown around the cowl and cockpit area and the entire fuselage sanded. Install the elevator and rudder pushrods. Either nyrod or balsa pushrods will work equally well. Install the throttle pushrod or cable if you are installing a throttle equipped engine. Remove the engine and mount and drill a small hole in the bottom of the cowl as shown, so that any accumulations of engine oil will drain free from the cowl interior. An HB .12 R/C engine was used to power my Prairie Canary. This engine has the added feature of both radial and beam mounts, as part of the crankcase casting. We mounted it via the radial mounts, thus eliminating the need for an engine mount. We also added a piece of brass tubing to the muffler outlet, which was elbowed downward, to deflect the exhaust away from the fuselage cockpit area. The brass tubing adds to the vintage appearance of the aircraft and reduces the amount of oil accumulation along the fuselage side. If an .09 to .12 engine is to be used, the engine downthrust angle should be reduced to 2 degrees, and the fuselage sides shortened, as shown on the larger engine installation detail. A 2 ounce tank should also be used, with the larger engine. The vertical fin and stabilizer can now be glued in place and the entire fuselage, fine sanded in preparation for covering.

Finishing:

The Prairie Canary was finished with yellow Solarfilm on the wing and tail surfaces, and K & B Super Poxy primer and blue enamel on the fuselage, simply because I prefer a painted fuselage. The choice of the finishing process is left to your discretion, as we all have our own favorite methods. Regardless of what finishing materials you decide to use; your primary consideration should be in keeping the weight down!

For this reason the use of a heat shrinkable film type covering, such as MonoKote or Solarfilm, is highly recommended. I believe a painted fuselage is perfectly acceptable providing that you go easy with the primer and paint build-up. (It helps to tint your primer as less color coat build-up is required.)

If you decide to use film covering on the fuselage — just remember to first seal the engine cowl area and wing supports with a fuel proof epoxy or paint.

Radio Installation:

The Prairie Canary was built and flown with Westport International Variant radio equipment installed. There is sufficient space in the radio compartment to accommodate almost any type of radio system. Your radio should be installed according to the system manufacturer's instructions.

Flying:

The Prairie Canary is designed for engines of .049-.12 cubic inches of displacement. If an .049 is to be used, the Cox TD engine is by far, the best choice. The .09-.12 throttle equipped engine offers greater versatility and flying fun, with it's high to low speed flight, stall turn, slow fly-by, touch and go, etc. capabilities. Flying your Prairie Canary should be a breeze. Just make sure it balances with the CG located as shown on the plans. Check your radio system, fuel it up, and take to the air. You'll find that the Prairie Canary is both easy and fun to fly. An ideal airplane to "barnstorm" around the school yard or flying field — I hope the Prairie Canary provides you with much flying pleasure! □

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