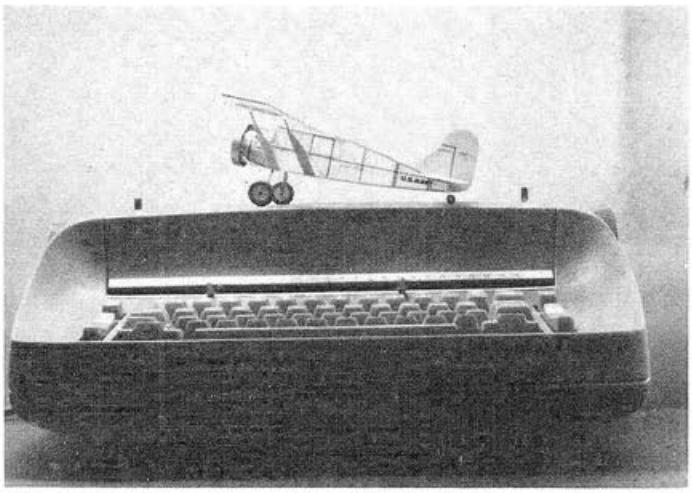
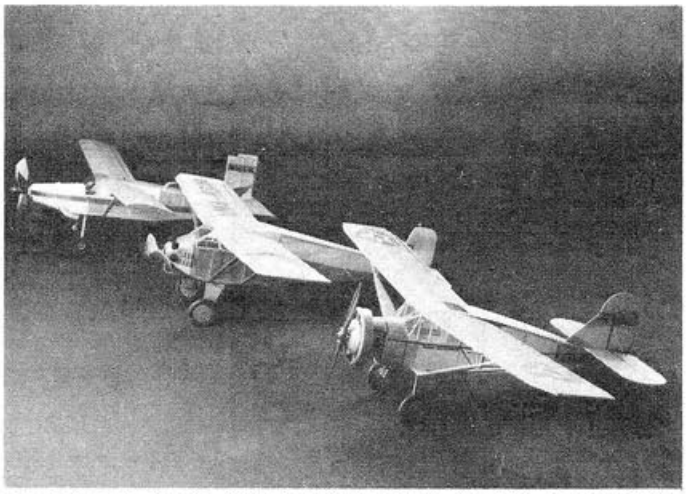
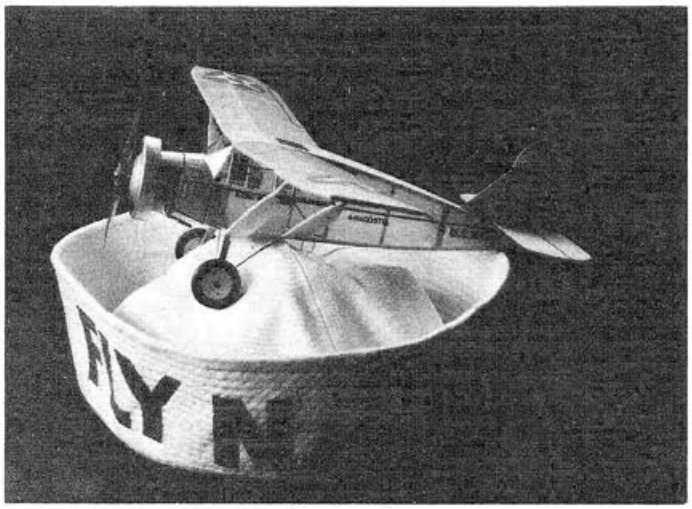


Tiny Bellanca Skyrocket is suitable for two events to be held at this year's National's. Classes are for prop-driven Navy jobs & Peanut Scale.



Mixed Nuts! A line-up of Peanut Scale models, front to rear; Bellanca Skyrocket, General Aristocrat, Pilatus Turbo-Porter; simple to construct.



Two poses of the Bitty Bellanca and the two reasons for its existence, U.S. Navy Scale and Peanut Scale, colored tissue covering and striping.

BUILD A BITTY BELLANCA

By W. C. HANNAN . . . The thirties return to life as Bellanca wings once again lift into the air in model form; suitable for the Navy Aircraft category in the indoor flying scale event or Peanut Scale. This "oldie" used by the U.S. Navy for radio experiments; model can reach one minute.

• This model was designed with several purposes in mind. It is suitable for the NAVY AIRCRAFT category of the indoor flying scale event. This class was originally proposed by VTO Editor Dave Linstrum for the Nationals contest, and has been sponsored by the National Free Flight Society. The idea was to put greater emphasis on naval aircraft, in recognition of the fact that the U.S. Navy has long served as the Nats host. In addition, it was hoped that the class would attract a great variety of models, which naturally add interest to any contest.

Initially, many people are apt to think only in terms of well-known Navy planes, such as Corsairs, Wildcats, Avengers, etc. And while these would make acceptable choices, they certainly are not the only options. Consider this selection of machines which have been employed by the U.S. Navy: Stinson "Reliant;" DeHavilland "Puss Moth;" Lockheed "Altair;" and Beechcraft "Stagger-wing." Or how about these obscure, but perfectly legitimate examples: Fokker D-VII: At least six were assigned to the U.S. Navy, as were a few of the similar appearing Fokker C-1s. (Reference: A.A.H.S. Journal, Summer 1960) Nieuport 28, Sopwith Camel, Sopwith 1-1/2 Strutter, S.E. 5, and Hanriot. Believe it or not, most of these WW I types were actually flown from the decks of U.S. Navy ships! (Reference: A.A.H.S. Journal, Summer 1965) If weirdos are your bag, how about these: Pitcairn autogiros (both winged and wingless versions); P.A.S. Gyroplane; Macchi M-16; or Stearmond-Hammond "Safety Plane?" Like to play it safe with prosaic, but easy-to-fly lightplanes? Check this group: Cessna "Bird Dog;" Fairchild 24; or Piper "Cub." So it can be seen that there is an almost endless variety . . . and we've only mentioned aircraft of the U.S. Navy. The event is also open to foreign navy planes.

Our little Bellanca is also small enough to be eligible for PEANUT

(Continued on page 59)

FULL SIZE PLANS OF BITTY BELLANCA ON NEXT TWO PAGES

Bitty Bellanca

(continued from page 19)

SCALE. Under the rules (which were originated by the Bridgeport, Conn. Flying Aces Club) these models must have a wing span maximum of 13" and a minimum of 10". PEANUT SCALE contests are now being held in several parts of the country as auxiliary "fun" events, in conjunction with more serious classes. The appeal of PEANUTS can be attributed to several factors. Among the older modelers, there is an element of nostalgia attached to these tiny terrors of the sky, since they are strongly reminiscent of the old pre-war 10 and 25 cent kits. Among the youngsters, the small cost of materials required for construction is an important consideration. Usually, the average builder can round up most of the needed supplies from his scrap box, and even the time required is minimal as compared to larger models.

In PEANUT SCALE, the accent is on *reasonable* scale, rather than exact scale. It is surprising just how much detail can be incorporated in a small model and still retain good flying characteristics. In fact, these models can be made to REALLY perform. Flights of 30 seconds are common, and a few Peanuts have even managed to exceed one minute. So much for the sales pitch, let's get on with this project.

The real Bellanca Skyrockets were employed by the U.S. Navy in a series of radio experiments during the 30s. One of these aircraft was also assigned to the Marines. Specifications were as follows: Wingspan: 46' 4"; Wing Area: 273 Sq. Ft.; Gross Weight: 4600 lbs.; Powerplant: P & W Wasp; Top Speed: 148 mph. It is interesting to note, that according to Aero Digest, the wing ribs of the real Bellancas were made of spruce, bass and BALSA wood.

CONSTRUCTION: First decide if your model will be used for indoor flying, outdoor flying, or dual purpose. If strictly indoor flying is contemplated, the model should be made of the lightest available balsa wood and covered with condenser paper. Conversely, for a strictly outdoor job, more rugged materials should be employed, and Japanese tissue can be used for covering. Some Peanut pilots, especially on the East Coast, even finish their models with several coats of opaque dope, and rely upon greater amounts of power to make up for the extra weight.

On the West Coast, many Peanuts are designed to be dual purpose aircraft. They are strong enough to be flown outside, assuming at least fairly calm weather, but are light enough to be flown indoors. With this type of model, colored tissue is generally used instead of colored dope for the overall coloration, but small details are painted to provide a more realistic appearance than that of the rather stark, purely indoor models. The model shown in our photos is of the compromise type, and can be considered a dual-purpose aircraft.

FUSELAGE: Our model is built in standard good-old-days fashion, starting with the two basic fuselage sides. When the sides have been completed, bevel the inside of both tail posts slightly, and glue them together. Add the cross-members, checking to be certain that the fuselage remains square as viewed from the front, and true as viewed from the top. Working directly over the top view will help ensure alignment. F-1 should be made from very hard balsa, or even thin plywood, for extra ruggedness. Be sure to glue the little instrument panel drawing to F-2, as it adds a little "dash" to the interior. Heh, heh. The five short nose stringers may now be installed, as may the windshield posts.

At this point, the hard balsa landing-gear mounts should be installed. Allow just enough room between them to accommodate the landing-gear wire.

LANDING GEAR: Bend the wire landing gear members to shape, bind them together at their lower extremities using thread and glue or epoxy, and insert the assembly between the L.G. mounts, being generous with glue. While you are at it, it is good to add a small fillet of glue to all of the important fuselage junctures, such as the tail peg holders, as these areas are subject to severe loads. On an "indoor-only" or very light outdoor model, you may construct all of the L.G. struts from balsa and eliminate the wire. On a more rugged outdoor version, it is suggested that the rear struts be made of a flexible material, in order that the main gear can flex rearward during hard landings.

For simplicity, the tail wheel may be simulated as shown on the plans. It functions as a skid since the wheel cannot revolve, but it is strong and light.

TAIL SURFACES: We used 1/32" sheet for the tailplanes, however if you prefer, you may substitute built-up surfaces, which are more in keeping with the overall translucent effect of a stick and tissue model. In either case, strive for light weight, to minimize the need for nose ballast.

WINGS: The wing panels are constructed in the traditional manner, but be careful to select straight, stiff wood for the leading edges, trailing edges, and spars to resist warping. The 1/16" square wing tips must be elevated 1/16" during construction, as will be apparent from the wing tip front view drawing. The root ribs are installed at a slight angle for dihedral purposes. (Some people seem to get away with using scale dihedral, but I prefer the safer approach.) The wing struts, sort of a Bellanca "trademark", are cut from 1/16" sheet balsa, and sanded to a streamlined cross-section.

NOSE BLOCK/COWLING: While this assembly may look a little formidable at a glance, it is composed of simple elements and can be constructed quite easily. Begin by laminating 3 sheets of 1/8" thick balsa for the nose piece. Cut and sand to the shape shown on the plan. The easiest way to do this is with a small hand grinder used as a lathe; if not available, the job can be done nearly as well by hand. Next cut out the 1/8" thick hard balsa plug, which must be a snug fit into F-1. Glue the plug to the back of the nose block, and allow to dry thoroughly. Drill a 1/16" diameter hole through the center of the unit to accept a length of brass or aluminum tubing which serves as a prop shaft bearing. Be certain to roughen the outside of the tube with a file, so that the glue can get a good grip on it. If any glue seeps into the inside of the tube, clean it out before it hardens. Seal the wood and paint it silver.

The dummy cylinders are made as follows: If the model is for indoor use the cylinders are constructed from a soda straw. For an outdoor job, a balsa dowel may be used instead. In either case wrap it evenly with sewing thread. There are two approaches to this. The time-honored method is to try for even spaces between the thread "cooling fins" (which is very difficult to do) in a consistent manner (at least for me!). Another method which is easier and still looks quite realistic, is to wind on TWO threads at once. If one is black and the other grey, the visual effect is surprisingly good. After the thread is wound on the core, give it several coats of clear dope to seal it in place. Next, slice the assembly into nine equal length cylinders. Place the nose block over the front view drawing and mark off the locations of the cylinders, which may be glued to the outside of the nose block, or glued into shallow holes drilled for the purpose. A pity that the Williams Bros. doesn't make this size . . . yet.

The ring cowling may either be stretch molded from thin acetate, using a D-size flashlight battery as a mold, or made up from a cardboard or balsa ring and a

strip of bond paper. If you do decide to mold the cowling, note that some brands of batteries have a nice, smooth radius, while others are wrinkly. Oddly, we found the best workmanship on a cheap Japanese brand.

PROPELLER: The original model was flown with a balsa prop carved from a blank as shown on the plans. However, if top performance is your goal, a larger prop may be used. This of course means that either the model must only be flown hand-launched, or that the landing gear must be lengthened to permit r.o.g. starts, at some sacrifice in scale appearance. A cut-down North Pacific "Skeeter" plastic prop may be used if you don't care to carve your own. Incidentally, there is some controversy among Peanuters regarding free-wheelers. Some claim greater glide stability without 'em, while others figure that the drag reduction advantages make them worth while.

COVERING: Lightly sand all structure prior to covering. The forward portion of the fuselage may be covered with bond paper, and the various louvers and air scoops can be made of similar material or balsa, if you prefer. For a strictly indoor model, condenser paper is suggested, since it is much lighter than tissue paper and non-porous (doesn't require doping). Most fellows pre-shrink condenser paper on a wooden frame, and do not re-shrink it on the model, since the delicate structures are so easily warped.

In the case of an outdoor or dual-purpose model, superfine Japanese tissue may be used. The original aircraft featured a silver and yellow color scheme. The yellow is no problem, but the silver may be. Current AMA rules permit the substitution of white tissue for silver, with no loss of scale points, but the effect is just not the same. Some local builders have obtained good results by applying a single thin sprayed coat of silver paint to white tissue or condenser paper.

Our model was covered with what must surely be one of the few remaining sheets of GENUINE PRE-WAR SILVER TISSUE, which was acquired from a kind and generous gentleman who prefers, for obvious reasons, to remain anonymous. Eat your hearts out!

The wing insignia are cut from colored tissue and doped in place, while the control surface outlines and other details may be drawn on with a fine fiber-tip pen, or made from thin strips of black tissue. The lettering may be done with artist's rub-down letters (try a large art supply store) or by hand. The decorating is best accomplished prior to assembly, since the parts can be handled more easily while flat on the workbench. Incidentally, this particular aircraft was repainted at least once, and the location and style of markings was changed slightly during its service career.

ASSEMBLY: Install the wing panels, checking for proper dihedral angle. Note that the rear spars meet at the center of the fuselage, adding greatly to the strength. A little careful fitting may be required to achieve the best possible joint. The wing struts will also require some trimming for an exact fit, which can best be determined by trial. The wing strut spreader bars and auxiliary braces may now be added, as shown on the front and side view drawings. For maximum strength, be sure to scrape away the tissue paper at each point of strut contact.

Install the tailplanes, check for proper alignment, and add the tail struts and thread rigging. The addition of the remaining knick-knacks, such as wheels, exhaust pipes, and strut fairings, completes the model.

FLYING: Insert a fairly short loop of rubber into the model, and add clay ballast as required to achieve balance close to the point indicated on the plans. If the model is to be flown outside, the usual "over tall grass" glide drill should be performed before power flights are attempted. Usually, the addition of a little additional weight at the proper end will do the trick to bring about a gentle glide path, but some elevator bending may be required too. If severe problems arise, make sure the model is not badly warped. It is possible to compensate for slight warps with adjustments, but serious ones should be corrected. When you are satisfied with the glide, wind in about 60 or 70 turns and try a hand launch. It is likely that side thrust and/or down thrust will need to be added by small balsa or cardboard shims which are inserted between the nose block and F-1.

When a satisfactory power pattern has been achieved, switch to a longer, lubed loop of rubber (which may bring about the need for additional balancing) and pack in more turns. Incidentally, there is no truth to the rumor that Peanut Oil makes the best rubber lube for these models! For maximum performance, stretch-wind, using a geared winder.

INDOOR FLYING: The adjustment of an indoor model is usually approached somewhat differently. While test gliding over a floor is a possibility, many builders prefer to make the initial tests with a few hand winds, r.o.g. style. Assuming that the balance is at least "in the ballpark," this is probably a safer approach. In this way, the model only makes short hops, and does not have far to fall if a problem exists. Also, it can be quickly determined if the model will be able to turn tightly enough to fly within the confines of the building. In the case of sites with high ceilings, a right circle is generally preferred. With a low ceiling, a left-hand circle has the advantage of producing less altitude gain with any given amount of power. Most fellows prefer to make thrust adjustments first, with only slight rudder changes when necessary. Additionally, a small amount of deliberate wing warping may assist in achieving the proper bank angle.

With an indoor model, the ideal flight consists of an r.o.g. start, a slow climb to within close proximity of the ceiling, a cruise at altitude, followed by a gradual descent. The last few turns should run out shortly after the model has landed.

Well gang, that about sums up the situation. Why not build one and get in on this shell game? It may help keep you out of the nut house! ▪