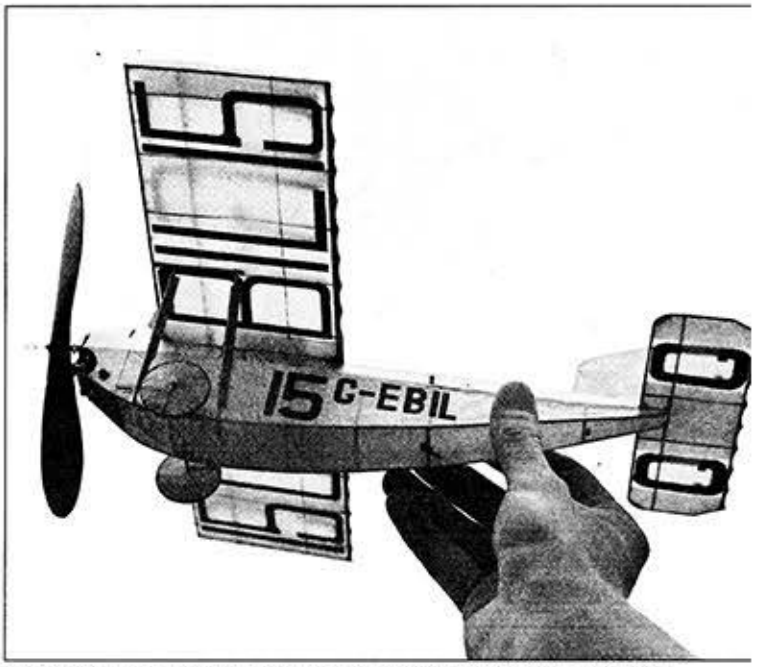
THE ANEC 1A LYMPNE RACER

Some of the most fascinating minimum-power aircraft ever designed came as a result of the lightplane trials at Lympne, England in the 1920s. The ANEC series has long been one of our personal favorites, and makes an excellent subject for Peanut Scale.

BY TOM NALLEN II



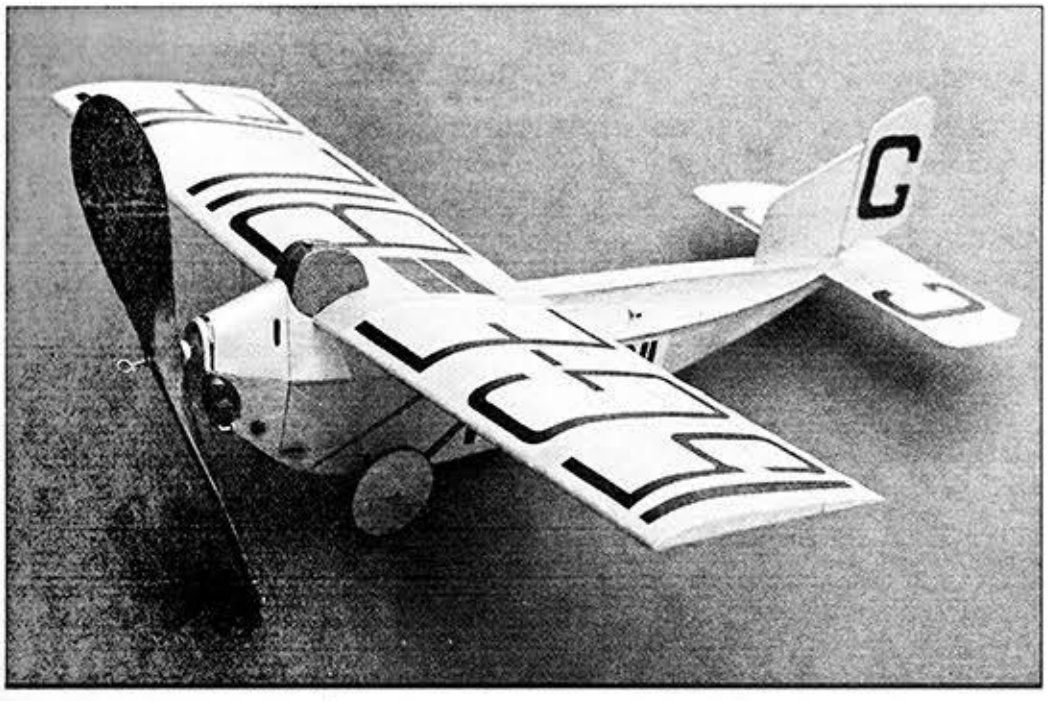
The ANEC 1a was a clipped-wing racing version of the original 1923 ANEC 1, which had a much longer wing and was little more than a powered glider. More information on the ANECs as well as many of the other Lympne entries can be found in Richard Riding's excellent book, *Ultralights, The Early British Classics*, available through Hannan's Runway, P.O. Box 210, Magalia, CA 95954.

A clattering, high-pitched whine shatters the early morning calm. Suddenly, through the low fog bursts an incredibly small and squat aeroplane, looking like an overgrown buggy which, because it's sprouted wings, thinks it can fly!

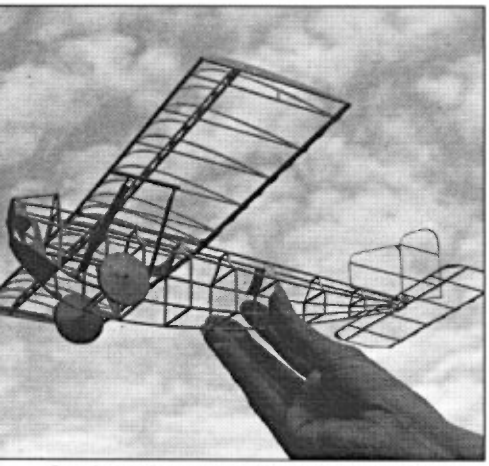
Gathering speed and bouncing on its large makeshift wheels, the little plane zips by. A shadowy figure works frantically beneath the broad wing to get the craft unstuck.

Bouncing off one final rise, the pilot hauls the snarling beast off the ground. She clears the trees in a shallow climb, her pilot glancing back over his shoulder and grinning broadly.

The setting for this imaginary vignette is the 1925 lightplane trials at Lympne, England. The odd little aeroplane is the ANEC 1a, the subject of this article. Its predecessor, the ANEC 1, was built in 1923 by the Air Navigation and Engineering Company to compete at Lympne that year. With a wingspan of 32 feet and powered by an inverted 696cc



With its unusual fuselage contours and prominent markings, the ANEC 1a makes an interesting and challenging subject for those with a couple of simpler Peanuts to their credit. It's also a fine flier; this one was lost O.O.S. at last year's FAC Nats. Would also make a fine subject for CO_2 power using one of the tiny Brown or Gasparin motors.



Bare-bones shot reveals the ANEC's very lightweight structure. With that fairly short nose moment, the tail end *must* be built light to avoid having to add nose weight.

Blackburne V-twin, it won the altitude prize with a flight to 14,400 feet and also tied for the best distance flown on a gallon of fuel—87.5 miles.

In 1925, with its wings clipped to 18 feet and fitted with a 1,100cc British Anzani motor for racing, the now ungainly little ship was rechristened the ANEC 1a. She was again piloted at Lympne by the indomitable Jimmy James, who won the speed prize by averaging 83.7 mph over the 50 km course—and yes, he did have problems getting the ship off and back onto the ground!

I thought the ANEC 1a would make an interesting and competitive Peanut model. My only regret is that I enjoyed her for just a short time. In her second contest, the 1993 FAC Nats in Geneseo, she was lost O.O.S., narrowly missing a 1st place finish.

CONSTRUCTION

First wet-form the fuselage longerons using a cardboard template to help maintain the fuselage shape, then build the fuselage sides in the conventional manner. This ship has a short nose moment, so use light wood in the aft end right from the start. Be sure to add the 1/20 square uprights at the very nose, just forward of the cutout for the dummy engine cylinders. These uprights will be cut away after the fuselage has been completed.

Assemble the fuselage box; make sure everything is square when viewed from all angles. Add the top and bottom sheet fill to the nose and tailskid area. Cement the 1/16 sheet cowling face to the nose crosspieces. Install the two nose formers. The noseplug former should be of hard balsa to withstand constant removal and replacement of the noseblock. Notch the formers and add the three stringers.

The fuselage turtledeck is made by first assembling the 1/20 square turtledeck top frame over the plan. The front of this frame is cemented to the rear of the second nose former; the rear is cemented to the upper longeron ends at the fuselage tail post. The sliced 1/20 sheet side formers are cut to size and cemented in place side-to-side, front to rear. I inserted a temporary thin foam profile between the turtledeck top frame and the fuselage box to maintain alignment as the side formers were installed.

Note that all of the side formers have the same constant radius arc. Cut out all of the formers at once, then trim to fit and cement in place. Cement the cockpit sides in place. Complete the turtledeck by carving the hard balsa rear motor peg support to a concave shape; cement this in place and drill it for the 3/32 aluminum tube motor peg.

Complete the fuselage by cutting away the front uprights, the forward ends of the lower longerons and the nose bottom sheet fill to make the openings for the dummy cylinders. Open up the landing gear support for the faired axle. Make the noseblock as shown, drill the assembly with a few degrees of downthrust and insert the 1/16 brass tube bushing. Bring the noseblock to a snug fit and finish shaping. The entire fuselage can now be fine-sanded and set aside for covering.

I designed the wing with a thick airfoil section to retain this characteristic feature of the original. Sliced rib construction is employed to maintain lightness with the bulky structure. Half-ribs are also used to help maintain the deep airfoil section. I used 1/32 balsa for the sliced ribs but would probably use 1/20 if I did it again, as the thin sheet balsa tends to distort across that broad chord wing—especially if you plan to shrink the tissue covering much! The 1/32 sheet spar is deep and I opted for lightening holes to minimize unnecessary weight.

These items noted, wing construction is pretty straightforward. Start by selecting stiff and straight lengths of 1/16x1/8 balsa for the leading and trailing edges; pin these down and cement the rib base strips in place. Cut out the spars and cement them in place, on edge, over the base strips. The inner edges of the outer wing spars are cut at an angle to mate with the short center spar section when the wing panels are blocked up for dihedral. Next, cement the sliced ribs and half-ribs in place, making sure to cement where the rib contacts the spar. Cement the tip ribs in place.

After the wing has been assembled flat on the building board, cut the dihedral breaks in the leading and trailing edges and block up each tip 7/32 inch; ensure that the spar sections mate well. Cement the dihedral breaks and gusset the joints. After the cement has hardened, install the strut mounts. Shape the leading and trailing edges and fine-sand the entire structure.

The tail surfaces are straightforward, but lightly constructed to avoid the need for unnecessary noseweight. The fin and rudder outlines are wet-formed around a light cardboard template. Gussets are added to strengthen key joints—don't leave these out. When construction is completed, carefully fine-sand the components and set aside for covering.

COVERING

Like many early British lightplanes, the ANEC was silver overall with black registration and racing numbers on white fields. Despite the availability of silver tissue, I chose to cover with white tissue, mask the registration and racing numeral fields, then airbrush the entire airframe with a coat of thinned Floquil silver paint. With all of that signage, very little paint will be needed! After the color is applied, remove the masks and carefully attach the black tissue markings with very thin lacquer or a spray adhesive. A final airbrushed coat of thin lacquer

will seal the covering adequately.

A few notes regarding covering. First, there's no need to cover the fuselage where the bond paper cowling panels will attach. Also, remember to adhere the tissue well to the concave turtledeck formers so that the covering won't pull away when shrunk. As for shrinking, I recommend that you not shrink the lightly built tail surfaces. Work to get as taut a covering job as possible without shrinking and use thinned lacquer to seal the tissue. Over time, the tissue will tighten somewhat with much less warping than if the tissue were water shrunk and doped.

ASSEMBLY

Fashion the landing gear axle out of two laminations of 1/32x1/16 balsa with .015 music wire sandwiched between. The wheels are foam discs with silver paper cones glued to each side. Note that there is no tire; the real ANEC simply had a leather strip tacked around the wheel! Use black tissue or silkspan to simulate this. Next, cut the cowling panels from light bond paper. Trim these panels to fit, paint silver and cement to the fuselage as shown.

The wing is cemented directly to the top of the fuselage turtledeck. Note that the stabilizer is designed such that the decalage is adjustable to optimize flight trim. For the first few flights, the stabilizer is cemented securely at the tail post only. the leading edges being tack-glued to the fuselage sides. Stabilizer incidence can then be adjusted in small increments by moving the leading edges up or down. Finish assembling your model by making and installing the short wing struts.

DETAILING

A realistic dummy engine can be made from paper tube or soda straw sections wrapped with thread and painted black; the cylinders are inserted in the cowling openings and cemented to the sheet fill between the upper longerons. The distinctive gravity feed fuel tank is fashioned from foam, hollowed and covered with tissue using thinned white glue. Paint the tank a brass color and mount it atop the wing with white glue. Don't forget the brown tissue strap and scrap balsa gas cap.

Our pilot needs a way to get in and out of this crate, so let's simulate the cockpit hatch using black tissue windows in a silver bond paper frame. Mount this hatch to the top of the wing using a spray adhesive. Now finish your model by inking the control surface and cowling panel outlines with a light straightedge and a fine-point Sharpie pen.

FLYING

My ANEC flew well with a 12-inch loop of 2mm FAI Tan rubber turning a 6-inch carved balsa prop. Flight pattern was right/right. The model balanced at the wing spar with no ballast necessary. Enjoy! ***MB***