BRITTEN NORMAN

BY BUD CHAPPELL

ISLANDER

Britten-Norman Islander BN2-A – what's that? Most people haven't heard of it. Some think the name suggests a seaplane. Some think they know what it is, but mistake it for the Aero-Commander 500. A few sharp aircraft types recognize it.

This situation is quite understandable, since the design hasn't been around very long compared to the more familiar twin types one usually sees as model subjects. The BN-2 series began to be manufactured in 1965-1966 and started showing up all over the world. I personally had never seen a full size Islander and was only vaguely aware that they existed until one day in November 1971.

How many of you modelers out there have been turned on by a centerfold in a magazine – in "Flying" magazine? Well, I was! It was instant mental conversion of that beautiful picture to a gorgeous Stand-Off Scale model. In minutes I knew what I would use for engines, construction – everything. Excitedly I dug into my books, came up with a little publication called "The Observer's Handbook," and found just what I needed to draw plans from - - - silhouetted three-views. A model with approximately 5 feet of span would not be too large and yet big enough to fly well. Since two O.S. 10's (Yes, Mr. Willard, I said 10's) had been pulling my scale 5 pound PBY5 around the previous summer, I decided they would again do the job nicely.

If you are surprised by the last statement, let us have a word here about twin engines. Some phenomena occurs when two small engines are paired up. It is natural to assume that two .10's would provide the power of a .20, but that ain't so! Because of the total propeller blade area, (you engineering types can correct me on this) you have pulling power similar to a .30. I have used this combination on three previous planes, and have experimented with different types, sizes and pitches of props, to get the best performance. Two .10's with Top Flite 7/6 nylon props will pull like a .30 – two .15's with 8/4 or 8/6 give power at the .40 or .45 level. For example, when onlookers examine my PBY5 flying boat and inquire about the size of the engines, their reaction is total surprise, and they remark that they thought they would be .30's, or something like that. When they see what these engines can do in flight they are amazed. So much for the cause of the small engine, and back to the design. As the scale and sizes worked out, 2" wheels all around were just right: 4 ounce tanks would cowl in well; the scale control surfaces would be fine, but for a little insurance, enlarging the stab and elevator seemed prudent. Construction details were weighed and worked out, and building was begun.

Some hints at this point might be helpful. The wing is probably the hardest part of this model to build, but it is not as difficult as it is unusual. The plywood center section spars are laid out first followed by the lower balsa spars and ribs. After the leading edge, upper spars, and sheeting have been put on, the trailing edge with ailerons should be added. MonoKote hinges on the ailerons proved to be excellent, providing an air tight seal over the joint. Add the bellcrank supports, bellcranks and linkage. As the ailerons and linkage are installed and adjusted, be sure to rig the ailerons approximately 1/16" above neutral – an old trick to get more wing tip control at low speeds and minimize snap tendencies. Much credit should also go to the vortex tips that contribute heavily in this area.

The plywood engine mount plates are next. Hardwood blocks are glued in place and drilled to provide engine bearers. Landing gear parts are formed and attached. Fuel tanks should be strapped in, and balsa rails glued alongside the tanks, which form the bases for the carved cowlings. Add the fairing blocks behind the main gear legs, and ahead of the leading edge, and the wing is ready for engines and manifolds, servos, and linkage.

The fuselage should be built in two box-like sections, and joined only after the wing hold-down screws and blocks have been aligned and fastened. This area is critical due to the unusual condition of the wing bolts having to handle not only the wing stresses, but the engines and main landing gear as well. It is essential that extra care be taken in making this area strong and correct, or a hard landing could yield some surprises in the "crack-and-strain" department. The nosegear is 1/8" music wire fitted inside a section of brass tube to which a brass glue plate has been soldered. A drop of solder on the top of the wire prevents the gear from falling out after the unit is slipped into place in the nose block. Epoxy glue is the proper fastener here. The square box directly behind the nose block provides a natural spot for the battery. In a fuselage as wide as this one, keeping this weight exactly centered is a good idea. The box also soaks up and distributes landing shocks very well.

The tail surfaces, with the exception of the stabilizer, are made of 1/4" sheet balsa. Control horns are hidden, the rudder having its own inverted tiller bar as the plans show. The elevator horn is placed inside the tail block which is grooved to permit the travel required and also accomodate the nylon pushrod connector.

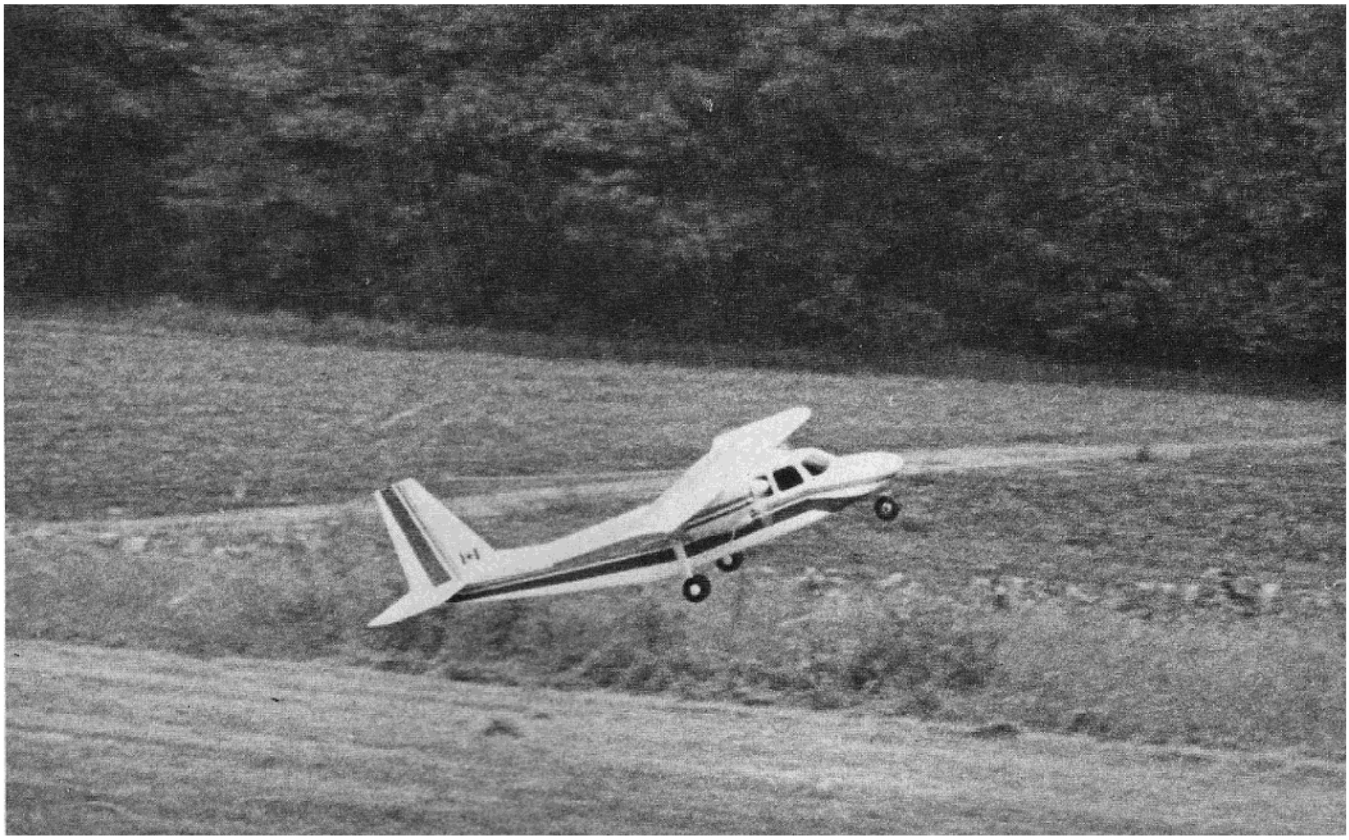
The entire model is covered with white Super Mono-Kote. Red, gold, and black accent stripes are used to imitate the color scheme of the original aircraft featured in "Flying" (November 1971) magazine. Windows are black MonoKote. Fortunately, the radio antenna wire is in the scale position. Banner wheels with the new white hubs are perfect for the main gear. Add white spinners, registration numbers, landing light lenses, wing position lights, and your favorite radio rig. Be sure to twist the wing panels as they are MonoKoted to provide washout at the tips. 1½ degrees is about right. This trick makes a flat wing think it has dihedral, and improves handling markedly.

Quite a bit of time was spent trying to devise a method of holding the cowlings in place. Many ideas were considered, and finally I hit on an easy way to do it: Three blades of aluminum, two on one side and one on the other, are forced into slots cut in the rails of balsa on the engine plates. The rails and blades are then drilled, and #2 wood screws are used to pin them in place. Matching slots are cut into the balsa cowls, and the cowls slip onto the secured blades in the rails. The cowls are then also drilled, and screws put in place to hold them on. To remove the cowls, take the screws out of the cowl parts only, and pull them off.

The finished aircraft was ready for test flights in March 1972. A Controlaire 4 channel single stick system was installed. Having had very little experience with ailerons, I decided I would use the lateral function of the stick for rudder, the rotary portion of the knob for ailerons, and for the flight tests, at least, keep the model's controls similar to three channel types with which I was more familiar. Flight testing a new plane is not the time to learn new pilot techniques!

Arriving at the club field, I proceeded to warm up and adjust the engines. Because they are inverted, an upside down starting position of the model is essential, and a padded field box makes the job easy.

After running the engines two or three times to check



Normal take-off rotation. Twin .10's more than adequate power.

From RCModeler Feb. 1974

rpm and fuel feed and with the model held in a nose-high position, taxi tests were begun. Only fair directional control was possible on the grass strip. The nose wheel being a full swivel type did not permit short or accurate turns, and was tricky on the take-off run. Nevertheless, it was now or never!

At full power the model accelerated slowly, bumping over the uneven surface. Quickly the bumps became hops and a little up elevator rotated the plane and then the nose lifted. One last hop on the main gear and it was climbing - - - and flying! Beautifully!

A straight-out climb was maintained until a safe margin of altitude allowed a shallow left bank. Control response seemed solid and accurate, and the climb proceeded to 300 or 400 feet in order to test maximum control maneuvers. Loops were crisp. Steep turns did tend to get steeper, but with no dihedral whatever this may be normal and expected. Slow flight showed the wing and the unusual vortex tips worked – no snap tendencies through the stall; in fact, the stall turned out to be a flat mushy turn to the right.

With my nervous tension ebbing, I flew a couple of passes over the runway at different power settings to get the feel of the approach and to test throttle response. On the next downwind leg, I closed the throttles and turned on base. On final, the model seemed to be picking up speed, and it turned out that if it is not flown to a landing at a shallow rate of descent, it does come in too hot. In fact, I nearly overshot the runway!

As I stopped the engines, I suddenly realized I had not used the ailerons at all! (Who, me nervous?) I promptly refueled the plane and attempted another take-off. The model veered to the right. Another run was tried and halted for the same reason. By holding the rudder and running the engines to full power, a nice take-off was accomplished. The second flight was excellent and the ailerons tested well - - - no trim changes were needed!

The first modification was to the nose wheel. A tiller bar was soldered to the nose wheel fork and connected to the rudder servo with a medium stiff piece of 1/16" wire. A nylon pushrod end was used on the tiller to avoid possible radio noise and to break loose in a hard landing situation instead of transferring the shock to the servo.

Another modification was the addition of an anti-collision beacon system worked up by club member Ken Lund; the two transistorised lights were mounted in the scale positions. They are more of a novelty than anything else – they can only be seen if the model is flying at dusk, at altitudes under 100 feet, or taxiing out for take-off. But a little more realism doesn't hurt, does it?

Having flown this model in excess of 40 flights to date, I think it can open up the twin-engine field to the average builder and flyer. He will be rewarded with success without going through the painful slowly-built scale route that often ends up with a terribly overweight craft that often does not survive flight tests. The Islander is no harder to fly than the average pattern ship, provided careful attention is paid to engine selection and tuning. Try this capable addition to the great aircraft of the world. As a matter of record, the prototype took three second place trophies in scale events at Rhode Island, New York, and Connecticut in 1973. So, give Scale, and the Islander, a try. □