Tardon

Attractive non-scale Formula II winner at '69 Nats is also a fine small-size pattern plane.

JACK SABINE and BRUCE LUND

Jack Sabine displays the fairly long high-aspect ratio wing which gives Tardon its fantastically quick pylon turns.

TARDON II WAS conceived at 20,000 feet over Mexico, while Jack Sabine and I were returning from the 1969 Mexican Nationals. Jack had just won the Open Pylon event with his "Tardon." In Spanish, Tardon means slow or pokey. Surprisingly, some of the local Mexican contestants had come over to ask what it meant—seems our dictionary was for Castilian, rather than Mexican, Spanish.

Thinking ahead to the Nationals to be held in Philadelphia, we realized that Tardon needed modifications to fit the recently revised AMA rules. Should new wings be built to meet the 1½-in. rule, or should a completely new plane be designed? The frontal area of Tardon could be reduced by placing the cheek cowls down on the wing like a Rivets, and the wing could be moved up closer to the thrust line. We decided to modify the winning Tardon.

The 1969 Nationals were only days away when the redesigned plane was ready for testing. That first flight was all, or perhaps even more than, a modeler could desire. The ship handled like a dream, and no trim changes were necessary. The only problem was with the pilot, who has a habit of dancing or shuffling his feet during a test flight. Jack was a nervous wreck, but the Tardon made a perfect three-point deadstick landing on our 240-ft. strip.

This plane is fantastic. It demonstrated its high speed capability by qualifying at the Nats with a hot 2:06. Yet, with the engine killed it glides in for landing like a sailplane. It shows no tendency to fall off on a wing during low speed turns and, with the limited elevator throw, it will not stall.

When flying full-bore, the stability is phenomenal. It flies the pylon course as though programmed by a computer. One takeoff during the National finals was made totally blind. Jack's mechanic stood up in front of him just as the plane was released. Jack just pulled up and waited until he saw his orange and white bird over the heads of those in front of him.

Tardon II is an easy plane to fly, even for a beginner. Most Class A fliers would have no trouble handling it. It also can be an attractive aerobatic plane—but fast!

Construction

Construction is somewhat more sophisticated and time-consuming than usual, but it is not difficult. The end results are well worth the effort. If possible, total weight should be kept under 5 lb.

Tail: The stabilizer is simple to build, with 1/16" sheet balsa covering a Warren truss frame. Note that spruce spars are used and that the leading edge is quite tapered. The center of the bottom sheet is slotted to allow the stabilizer to slip over the sub-fin. When making this assembly, epoxy the joint thoroughly, since quite a bit of flexing takes place here. However, after a year of flying, our Tardon's joint has not failed.

The elevators are made from a sheet of ¼" balsa with ¼" plywood joining them. Vertical fin and rudder construction is similar to that of the stabilizer. The direction of grain and type of balsa are most important; choose the wood carefully and keep it light. Be sure to use toothpicks when securing the rudder hinges, particularly the bottom hinge.

Wing: The original Tardon II had a foam core wing. Templates are shown on the plans for either foam or built-up construction. When foam is used, leave out the ⅛ x ¼" wing spars. If the equipment necessary to build foam wings is not available, use the stack method for cutting ribs. Cut a plywood or aluminum template of the root rib and the tip rib. Between these add 14 pieces of 1/16" sheet balsa. Tack-glue all these together with Ambroid and, when dry, carve down to the template. Then slip a razor blade between the ribs to cut the glue joint. Draw the centerline on each rib, as well as a centerline the full length of the ¼ x ⅝" leading edge and ¼ x ¼" trailing edge.

Pin the leading edge to a flat work surface, using ½" blocks under it. Pin the trailing edge to the surface, with 11/16" blocks beneath it. Make sure the centerlines face the ribs. Insert each rib in its proper place and glue with Titebond. Check the alignment of each rib centerline in relation to the leading edge and trailing edge centerlines. Allow this construction to dry overnight. Then add the ¼ x ⅛" wing spars and 1/16" sheet webbing between them. Do not remove the wing from the table until the assembly has dried overnight.

Add hardwood landing gear blocks. Cover each wing panel with 1/16" balsa. Using ⅜" select grade balsa, add the wing trailing edge and ailerons. Install the aileron torque arms and ⅛" brass tubing. Install wing tip blocks. No dihedral bracing as such is used. Simply epoxy a 4" piece of 2-oz. fiberglass cloth around the center of the wing, after blocking the tips up ¾".

After the epoxy has cured, the cutouts for the fuel tank and aileron servo can be made. Give the completed wing a final going-over with sandpaper, then make the cutouts for the landing gear. Remove the ailerons from the wing and add the hinges.

Fuselage: The fuselage sides are cut from 3/32 x 4 x 48" balsa. Cut out for the wing but do not cut through to the bottom of the fuselage. This will be done later. Using contact cement, glue the 1/32" sq. plywood and the 3/16" sheet balsa doublers to the sides. Add the ¼" plywood engine mounts, ⅜" triangles, and 3/16" sq. pieces to each side. After both sides have thoroughly dried, pin the bottom of each fuselage side to the plan, starting at the tail. Insert the 3/16" sq. pieces across the fuselage top and bottom.

Now add Former F4 which has been cut from ⅛" plywood. Install the vertical grain portion of the sub-fin at this time, checking alignment carefully. Then pull the nose together and add Formers F2 and F3. This is the best time to add the ⅜" triangle stock between Formers F2, F3 and F4 and the fuselage sides. Glue the 3/16" sheet turtle deck and the ¾" nose block in place.

After drying overnight, the fuselage may be removed from the building board, turned over, and the bottom glued in place. Add enough ⅜" sheet blocking to the nose to allow a good profile after carving and finish off by gluing F1 in place. Round all corners as much as possible and rough-sand.

Cut out fuselage sides for the wing. Glue Former F4A with wing hold-down fitting in place. The fuselage is fitted to the wing, with 1/32" clearance allowed along the top of the wing for the plywood wing saddle. When the wing fits to satisfaction, glue the plywood saddles to the fuselage sides. Hold them in place, with Saran Wrap on top of the wing, until the glue has dried. Next, the cheek cowls are cut and rough-carved. Sand them to approximate shape, hollow out and glue in place. Form the remainder of the wing fillet with Epoxolite putty. Fit the section of fuselage under the wing in place. Glue to the wing,

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Formula II planes with 600 square inches are fairly large. Because of the drag of the larger wing, well-thought-out streamlining is essential. Fuselage profile shows careful designing.

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adding 1/16" plywood formers fore and aft.

Cut out the cockpit and finish the area under the canopy. After a pilot and instrument panel are installed, epoxy the canopy in place.

Finishing and Painting: The choice of finishing methods is varied. We began with a good sanding; two coats of Hobbypoxy clear; two coats of automotive primer, wet-sanded between coats; and the final finish of two coats of dope or acrylic lacquer. Rub and wax as desired.

Equipment Installation: When the finish has dried, hinge the control surfaces, making sure they all move freely. Add the landing gear and tail-wheel. Install a K&B 40 rear rotor with a 2¼" spinner.

Because of the long tail-moment, radio equipment must be placed as far forward as possible. Even so, it may be necessary to add lead to the nose. Tardon II weighed in at 4 lb. 12 oz. before balancing. After balancing, it checked out at 5 lb. 4 oz. It is more important that the plane balance at the CG than weigh in at 5 lb.

Control movement is quite important, since most RCers use too much. By following the recommended throws on the plan, no difficulties should arise. Remember that at higher speeds less throw is just as effective as a large throw at slow speeds.