THE NO TOW

BY BOB WALLACE

The No Tow was conceived, designed and built in an effort to produce a sport sailplane that would not require a tow winch, high start, or power pod; would be easy to fly; possess small field capability; be inexpensive to build; and of simple proven construction techniques.

If you are fortunate enough to live in one of the few areas where a suitable slope soaring site is available, this would be an easy order to fill. However, Central Connecticut, like most of the country, is not blessed with such an area; nor are conditions in Connecticut regularly favorable to thermal soaring. I did not want to be dependent upon a tow winch or high start and it was my feeling that a power pod attached to any sailplane had the same aesthetic effect as strapping a step ladder on the roof of a sports car! A drop-off type of parachute equipped pod was also rejected as it eliminated flying from small fields (unless you buy your engines and pods by the dozen). Have you ever retrieved one from a tall tree or searched for one in a corn field?

It was, therefore, decided that a throttle equipped engine, conventionally mounted in the nose of a sailplane, offered the best solution. The engine chosen (because I happened to own one) was an O.S. Max .10 with throttle; although any other throttle equipped .09-.10 engine would work equally as well. The advantages of installing a throttle equipped engine are obvious. You can climb rapidly to any desired altitude and either throttle back to idle, or shut the engine down, via the throttle trim lever. You'll be amazed at how long a .10 engine will idle on a two ounce tank! The throttle equipped engine also gives you the added advantage of flying out of very small fields where landing could be a problem. With throttle, you can simply "go round" if you're high on final approach or give it a touch of throttle if you're low. Regarding the construction methods, a cursory glance at the plans quickly indicates that building TNT is rapid and utilizes basic concepts. The flight qualities of TNT are outstanding as it does not possess any bad characteristics or traits. The plans show relatively large radio components installed (World Engines S-11 servos and a 500 MAH battery pack). TNT flies fine with the gear which is shown. If you own the smaller size components — so much the better.

If you're looking for a relaxing fun type aircraft, that can be flown without the bother of setting up a winch or high start, out of any small field, and is not reliant on thermal activity for length flights — why not build a TNT?

TYPE AIRCRAFT
Powered Sport Sailplane
WINGSPAN
72 Inches
WING CHORD
9" (Root) 5⅜" (Tip)
TOTAL WING AREA
518 Square Inches
WING LOCATION
High Wing
AIRFOIL
Flat Bottom
WING PLANFORM
Double Taper
DIHEDRAL, EACH TIP
5¼ Inches
O.A. FUSELAGE LENGTH
36 Inches
RADIO COMPARTMENT AREA
(L) 9" X (W) 2½" X (H) 2½"
STABILIZER SPAN
23⅜ Inches
STABILIZER CHORD (incl. elevons)
4¾ Inches (Avg.)
STABILIZER AREA
117 Square Inches
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top of Fuselage
VERTICAL FIN HEIGHT
6⅞ Inches
VERTICAL FIN WIDTH (incl. rudder)
5¼ Inches (Avg.)
REC. ENGINE SIZE
.09-.10
FUEL TANK SIZE
2 Ounce
LANDING GEAR
Single Wheel
REC. NO. OF CHANNELS
3
CONTROL FUNCTIONS
Rudder, Elevator & Throttle
BASIC MATERIALS USED IN CONSTRUCTION

Fuselage	Balsa and Ply
Wing	Balsa and Spruce
Empennage	Balsa
Wt. Ready-To-Fly	32 Oz.
Wing Loading	8.9 Oz/Sq. Ft.

CONSTRUCTION

Start by making the two rib templates out of aluminum or plywood. Make two sets of 13 ribs (one set for each wing panel) according to the plan details. Now take each pair of ribs and pin them together. Sand off the angular segment on the top and front of each pair of ribs. File the spar notches square to the ribs. Unpin the stack.

Wing: Cut the bottom 1/16" leading and trailing edge sheet pieces and pin them in place over the plan. Be sure your building surface is absolutely flat. The center section 1/16" sheet and bottom 3/16" x 1/16" rib cap strips are now added. The 5/16" square leading edge should now be cut at an angle so that it is 3/16" at the front. If you have a table saw, use it; otherwise a plane and sanding block will do. Pin the leading edge and lower 1/4" x 1/8" spruce spar in place. Glue this assembly together. When dry, unpin the trailing edge sheeting and capstrips for the outer most three rib sections and insert the washout blocks. Re-pin the trailing edge sheeting. The ribs and top 1/4" x 1/8" spruce spar are now pinned in place, and glued. Be sure that the center rib (W-1) is angled (8 degrees) to allow for the proper dihedral angle.

Cut and glue the scrap block in place where the nylon hold-down bolt is situated. Add the 1/16" top leading edge, trailing edge, and center section sheeting along with the top 3/16" x 1/16" capstrips and glue in place. Repeat this process for other wing panel. The two wing panels are now glued together at the proper dihedral angle. The dihedral should be measured at the spar ends or leading edge, due to the built-in washout. Add the 1/4" sheet tips and sand the wing to shape. Reinforce the wing center section with 3" wide fiberglass cloth and resin. Set the wing aside for now.

Tail Surfaces: The tail surfaces are constructed over the plan using the indicated balsa sizes. The plan is self-explanatory.

Fuselage: Cut out the 1/8" fuselage sides and all of the fuselage formers and bulkheads (F1, F2, F3, F4, F5T, F6T). Mark and drill the engine mount holes in the firewall (F2), using the center lines shown on the plan. Install 4-40 blind nuts in the firewall. Glue firewall (F2) and bulkheads F3 and F4 to the fuselage sides, making sure that each is properly aligned. When dry, add formers F5T

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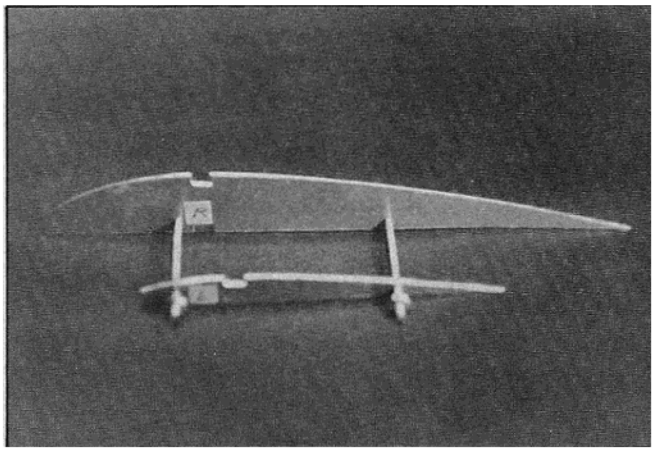
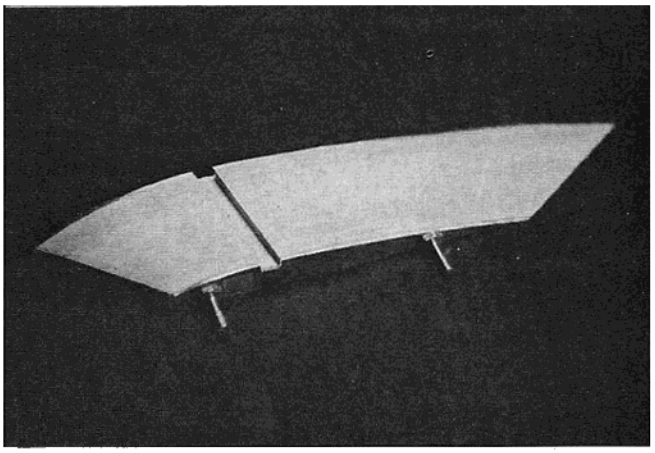
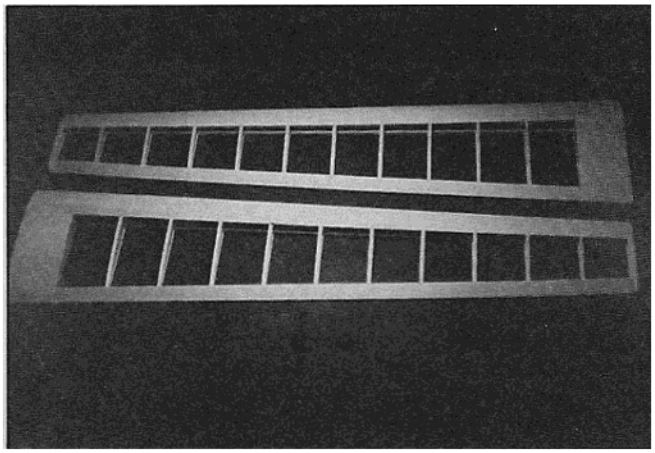


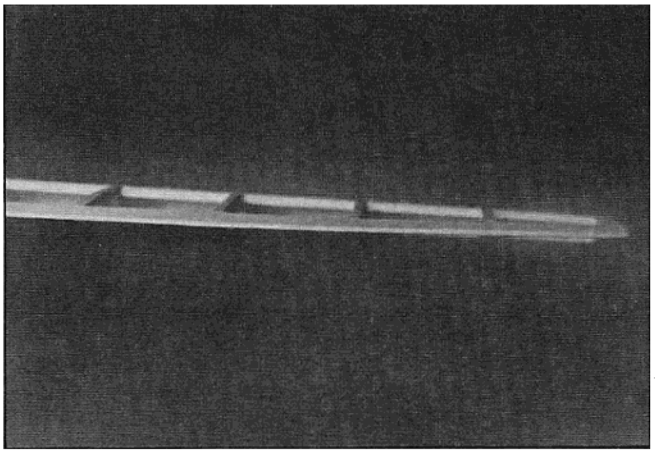
Wing rib templates for the T.N.T.



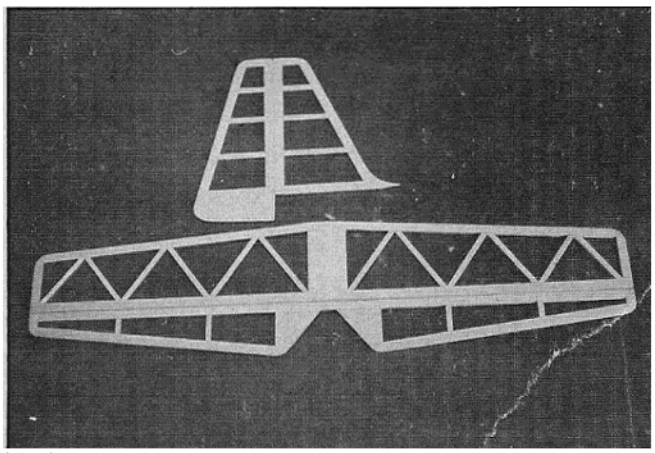
Wing rib templates and ribs for one panel.



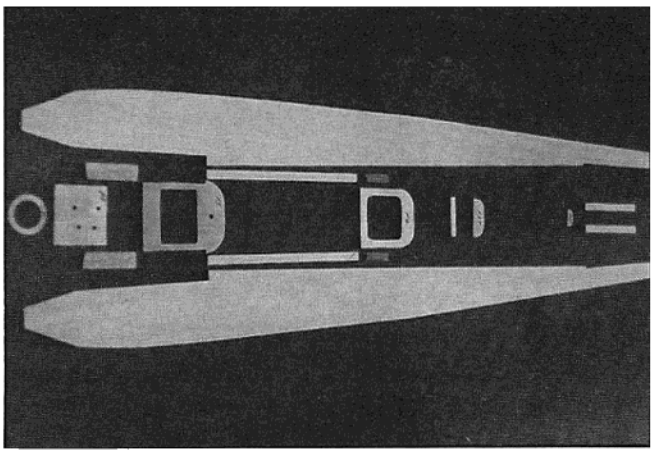
Both wing panels completed in this shot.



Notice washout in wing tip.



The empennage, ready for covering.



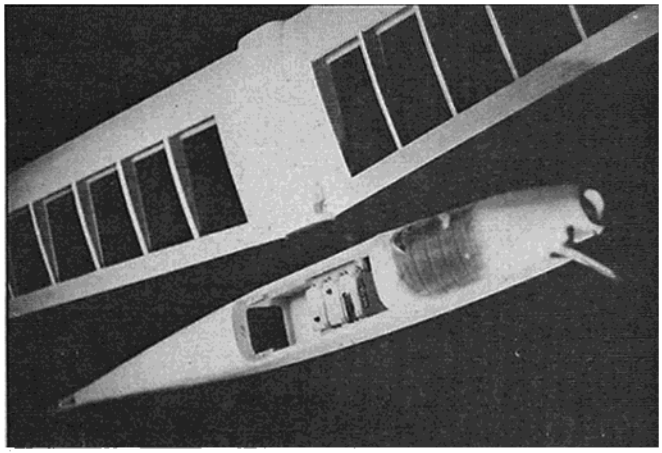
Fuselage parts cut out, ready for assembly.

plus the lower 1/8" x 1/4" brace below F5T and F6T. Add the 1/8" x 3/8" wing saddle and stabilizer doublers, hardwood wing hold-down blocks, and bring the fuselage sides together at the rear and glue.

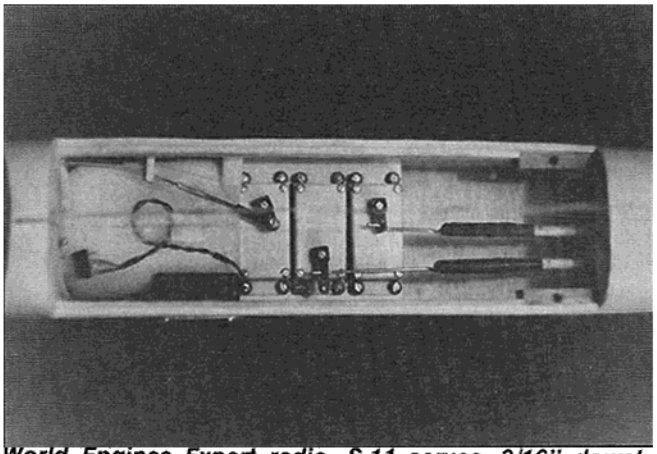
Add the 1/8" bottom sheeting cross grained. Make up the plywood landing gear well pieces, axle blocks and axle. The axle length should be to a length (1⅜") that allows it to be moved laterally in the blocks to accept the 1/16" wheel collars and 1¼" wheel after the wheel well has been finished. Install from inside the fuel tank — battery pack compartment. Cut the wheel well opening in the bottom sheeting. Add the 1/16" rear top sheeting and the small block directly behind former F6T. Add the 1/4" x 1" trailing edge stock firewall supports.

Position the wing in place, making sure that is is properly aligned. Using the 3/16" hole in bulkhead F3 as a guide, drill a 3/16" hole into the leading edge and center ribs of the wing. Remove the wing and glue the 3/16" hold-down dowel into the wing. Reinstall the wing and drill two holes with a #25 drill through the wing at the trailing edge (as indicated) into the hardwood hold-down blocks. The holes should be drilled at the proper angle to insure that the nylon bolts will be square with the top of the trailing edge, when they are in place. Remove the wing and tap the holes in the hold-down blocks with a 10-24 tap. The holes through the wing should be re-drilled with a 3/16" drill to accept the 10-24 nylon bolts.

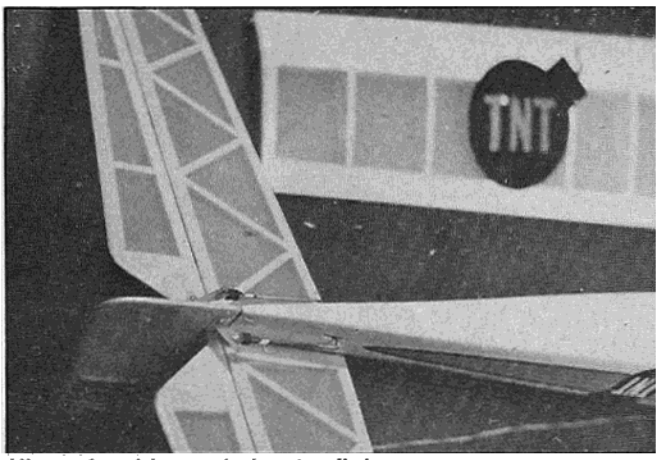
Draw the fuselage sides in and install the 1/16" plywood nose ring (F1). Add the top and bottom nose blocks. Add the



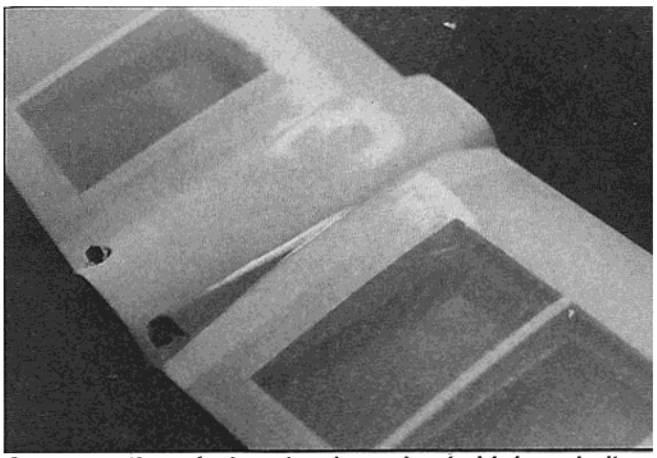
Fuselage and wing ready for covering.



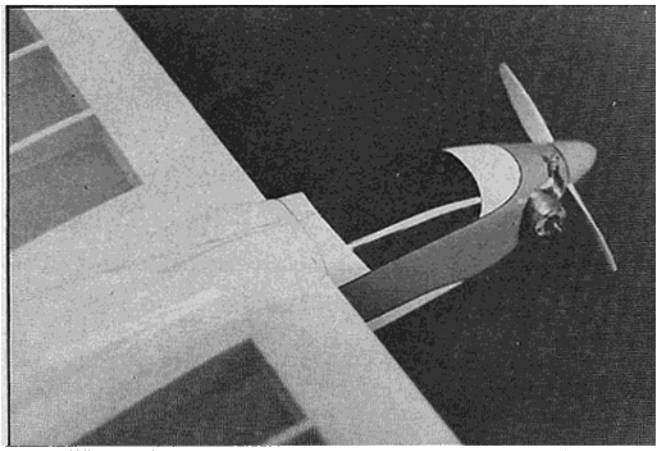
World Engines Expert radio, S-11 servos, 3/16" dowel pushrods



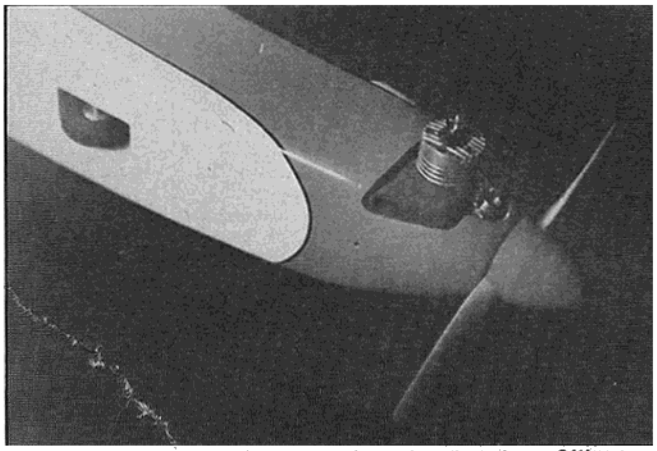
View of rudder and elevator linkages.



Center section of wing showing nylon hold-down bolts.



Note sidewinder engine mounting – any .09 to .10.



Exhaust from old R/C car exhaust extension. Silicone rubber mounting.

1/8" sheet cockpit floor and front and rear cockpit blocks. Sand the fuselage to shape using the F1 nose ring and bulkhead F3 as guides in shaping the nose-cockpit area. Cut away the right fuselage side between nose ring F1 and firewall F2 to facilitate installation of the engine and engine mount. Bolt the engine mount in place. Position your engine on the mount with proper spinner clearance and mark the engine mounting hole locations on the mount. Remove the engine and mount, then drill and tap the engine mount. Reinstall the mount and engine and mark the locations for your fuel lines and throttle linkage rod. Remove the engine and mount and drill the fuel line and throttle linkage rod holes.

Reinstall the wing and glue the center section wing blocks in place. Blend the wing blocks into the contour of the fuselage. Glue the stabilizer/elevator and rudder/fin assemblies in place, making sure that they are aligned properly. The servos, servo rails, pushrods, etc., are now installed. The entire model should now be fine sanded in preparation for finishing.

Finishing: While the choice of finishing materials is left to the builder, I favor the use of the heat shrinkable films (such as MonoKote or Solarfilm) for the wing and tail surfaces and a painted finish on the fuselage (such as K & B Superpoxy).

FLYING

The TNT, being devoid of nasty flight quirks is a snap to fly. Just check out your radio, fire up your engine, and give it a toss. Actually the TNT will fly out of your hand. □