TERRIER

Want a super performance aircraft with a .25, then this is it.
By Alan L. Clark

The Terrier is the third in a series of designs which have been refined to get the best possible combination of performance from a standard .25 engine. Refinements were made that improved both in-flight handling and aerobatic capability as well as lowering the stall speed and greatly improving ground handling.

If, like me, you have enjoyed the economy, responsiveness, and small field capability of the 1/2A ships, but like the easy starting, easily throttled engines and large size of the .40 to .60 ships, then the Terrier is what you have been searching for. The Terrier is the size of most .40 and some .60 aircraft, but uses a standard, economical .25 engine. I used the O.S. .25 (non-Schnuerle) on my Terrier because it idles very slow and will run about eleven minutes on four ounces of 10% nitro fuel.

Even though the Terrier is large (58" span, 550 square inches area), it weighs only 55 ounces resulting in a 14.4 oz./ft^2 wing loading. This gets rid of the "powered bomb" characteristic which many aircraft have and allows short take-offs, slow landings, and slow, graceful aerobatic maneuvers which can all be flown directly in front of you.

ABOUT THE AUTHOR

The author, Alan L. Clark, is a private pilot with single engine and glider ratings and has previously owned a Cherokee II sailplane and 1/3 share in a 1946 BC-12D Taylorcraft. He has logged over 40 actual hours of aerobatics in a Cessna Aerobat, Bellanca Citabria, Bellanca Decathlon, and Starduster Too. He has been modeling since the age of 7 and began flying R/C in 1971 with an Ace rudder-only system in a Midwest Whiz Kid. Alan began designing R/C models in 1972 and has since designed many power and sailplane models including the "Yellowjacket" 1/2A pylon racer published in the September 1977 "Model Airplane News". He received an Aerospace Engineering degree from Iowa State University in 1974 and presently works for the Army Civil Service as the lead Reliability Engineer in the Hellfire Missile Project Office, U.S. Army Missile Command in Huntsville, Alabama. He was married to his wife, Kimberly, in 1978 and they now have two boys aged 4 months and 2½ years. Alan's present modeling interests include 1/2A pylon racing, sailplanes, sport flying, scale, and helicopters.

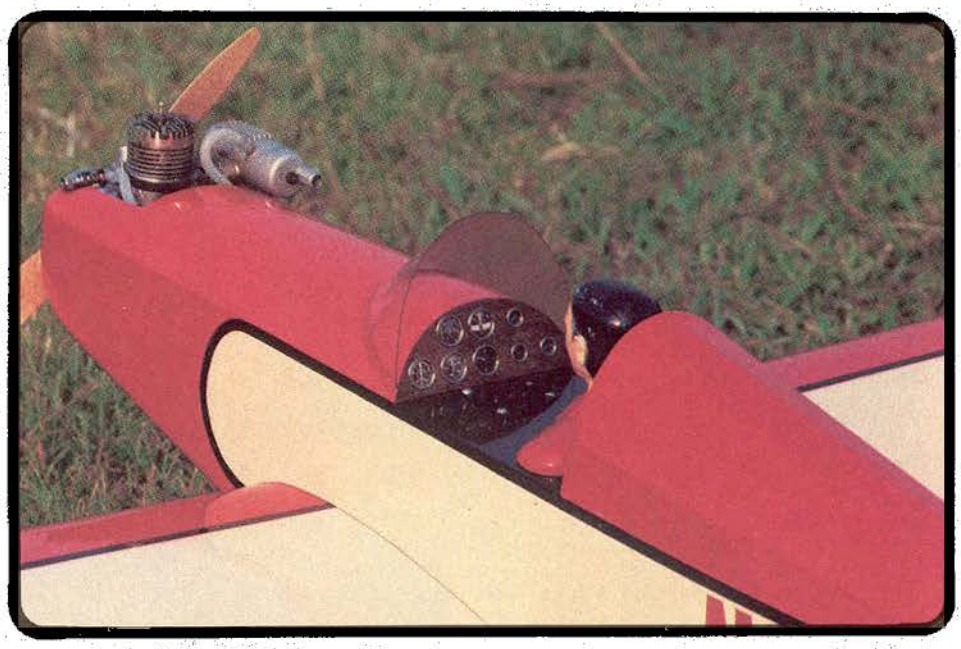
Due to the extra drag of the large, scale-size fuselage with open cockpit (actually the entire model is about 1/6 scale of a full size aircraft), the level flight speed does not get out of hand and, when flying aerobatics, the speed builds slowly when the nose is down.

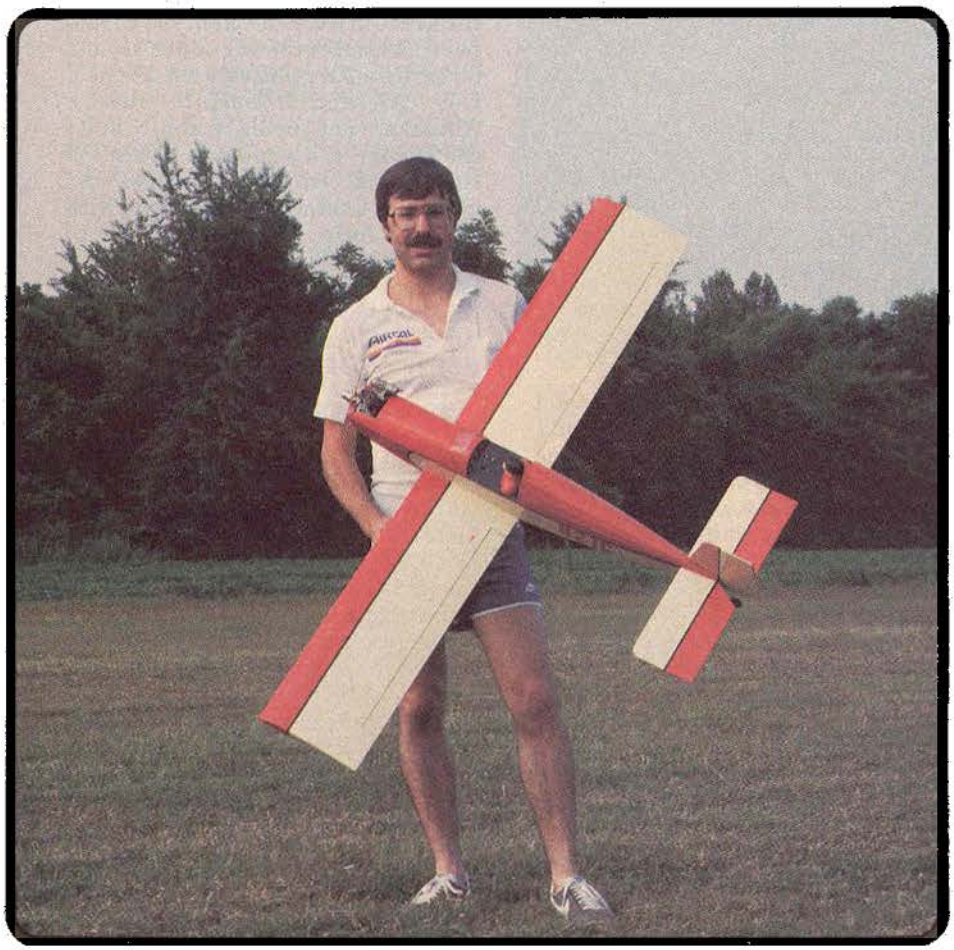
The real key to the excellent performance of the Terrier on a .25 engine is the airfoil. After much experimentation on various models, a modified NACA 2415 airfoil was selected. This airfoil exhibits a very smooth lift to drag curve (with no drag bucket) which provides very predictable handling in pitch at all speeds. With this airfoil, little down elevator is required to fly inverted, outside maneuvers are easily accomplished, and the sink rate on final approach is much less than the sink rate of a symmetrical airfoil. The airfoil was modified by reducing the leading edge radius 40% and re-contouring the first 15% of the top and bottom surfaces. This modification results in cleaner snaps and spins: entries are easy and the maneuvers are easily stopped when the controls are released. Even with this modification the airfoil exhibits outstanding low-speed stall characteristics. The Terrier can be dragged in tail-low and actually

landed tail-wheel first without dropping a wing (this is helped in part by not running the ailerons all the way to the tips, thereby avoiding premature tip stall by a lowered aileron). Head high passes (even inverted) can be flown extremely slow at about one third throttle with the nose high without fear of tip stalling. In addition to its other benefits, the modified NACA 2415 is a 15% thick section allowing a very strong, light wing to be built. Also the extra drag (due to being thicker than usual) helps keep the level flight speed from getting out of the fun-to-fly regime.

By combining the modified NACA 2415 airfoil with a large 58" wingspan and a fairly high aspect ratio of 6:1, excellent climb and glide performance are obtained. The large span gives a low span loading (weight/span) which results in a low sink rate in the glide since sink rate is proportional to the square of span loading. The relatively high aspect ratio gives a reduction in induced drag which requires less horsepower for a given rate of climb as well as increasing the glide ratio.

The ground handling of the Terrier is better than any other taildragger I have seen, and is better than many tricycle gear aircraft due to the very wide spacing of the main wheels and their being located fairly close to the C.G. It is literally impossible to drag a wing tip while taxiing no matter what the wind condition. Landings, either wheel or 3-point attitude, are very easily accomplished, even in high crosswinds. I have flown regularly in crosswinds high enough to prevent me from taxiing to the pits due to the wind blowing the tail of the plane around so that the nose was into the wind, even while holding full opposite rudder! The flared attitude of the Terrier also





TERRIER

Designed By:
Al Clark
TYPE AIRCRAFT
High Performance Sport
WINGSPAN
58 Inches
WING CHORD
9½ Inch
TOTAL WING AREA
550 Sq. In.
WING LOCATION
Low Wing
AIRFOIL
NACA 2415 Mod.
WING PLANFORM
Constant Chord
DIHEDRAL EACH TIP
1 Inch
O.A. FUSELAGE LENGTH
41"
RADIO COMPARTMENT SIZE
(L) 9½" (W) 3½" (H) 2½"
STABILIZER SPAN
19 Inches
STABILIZER CHORD (incl. elev.)
5¾ Inch
STABILIZER AREA
110 Sq. In.
STAB AIRFOIL SECTION
Flat
STABILIZER LOCATION
Top Of Fuselage
VERTICAL FIN HEIGHT
8 Inches
VERTICAL FIN WIDTH (incl. rud.)
6" (Avg.)
REC. ENGINE SIZE
.25-.35 Cu. In.
FUEL TANK SIZE
4-6 Oz.
LANDING GEAR
Conventional
REC. NO. CHANNELS
4
CONTROL FUNCTIONS
Rud., Elev., Throt., Ail.
BASIC MATERIALS USED

Fuselage	Balsa, Spruce, Ply
Wing	Balsa, Spruce, Ply
Empennage	Balsa
Wt. Ready To Fly	**55 Oz.**
Wing Loading	**14.4 Oz./Sq. Ft.**

Terrier Materials List

1/16" ply, 1.5" x 12", 1 req'd — rib doublers
3/32" ply, 1" x 2.5", 1 req'd — tailwheel bracket mount
1/8" ply, 6" x 12", 1 req'd — landing gear mounts, cockpit floor, F2, F2A, T2
3/16" ply, 4.25" x 4", 1 req'd — firewall, wing mount
3/32" x 3/16" x 36" spruce, 4 req'd — turtledeck stringers
1/4" sq. x 36" spruce, 5 req'd — spar caps, pushrods, servo rails
1/4" dia. dowel, 2" req'd — front wing hold-down
1/4" sq. x 36" balsa, 2 req'd — leading edges, T1, T4, T5 crosspieces
1/4" triangular x 36" balsa, 1 req'd — fuselage and gear mount reinforcement
1.25" T.E. stock, 5" req'd — nose blocks
3/4" x 3" x 6" soft balsa, 1 req'd — nose blocks
1/2" x 3/4" x 7" soft balsa, 1 req'd — tail section fairing blocks
1/2" x 1.5" x 20" soft balsa, 1 req'd — wing tips
1/16" x 3" x 36" medium balsa, 9 req'd — ribs, capstrips, D-tube shtg, center section shtg, T.E. shtg, fuselage doublers, T3 and F3 doublers
3/32" x 3" x 24" medium-hard balsa, 1 req'd — fuselage bottom, spar webs
1/8" x 3" x 36" balsa, 3 medium, 1 hard req'd — ribs, front turtledeck fuselage sides, stabilizer mount doublers, spar webs, T1, T3, T4, T5, F3
3/16" x 3" x 36" medium balsa, 2 req'd — empennage, T6
3/16" x 1" x 29" medium balsa, 1 req'd — trailing edge cap
1/2" x 3" x 36" medium balsa, 1 req'd — trailing edge/aileron stock

Hardware:
1/16" dia. x 36" music wire, 1 req'd — tailgear and pushrods
3/32" dia. music wire, 16" req'd — aileron torque rods
1/8" dia. music wire, 26" req'd — landing gear and elevator horn
1/8" O.D. brass tube, 7" req'd — aileron torque rod bearings
4-40 bolt with blind nut, 4 req'd — engine mount to firewall
Du-Bro #111 threaded coupler, 4 req'd — aileron, rudder, elevator pushrod ends
Du-Bro #109 kwik link clevis, 2 req'd — rudder and elevator pushrods
Goldberg #247 aileron pushrod, 2 req'd — aileron hookup
Rocket City #5 aileron link, 2 req'd — aileron hookup
Du-Bro #165 flex cable, 1 req'd — throttle hookup
Goldberg #215 short control horn, 2 req'd — rudder, elevator
Du-Bro #158 landing gear straps, 1 set req'd — landing gear mounting
1/16" wheel collar, 1 req'd — tailgear
1/8" wheel collar, 4 req'd — maingear
Du-Bro 2.75" wheel, 2 req'd — main wheels
Perfect 1.25" balloon wheel, 1 req'd — tailwheel
Goldberg tailwheel bracket, 1 req'd — tailwheel assy. mounting
Rocket City nylon hinge material, 1 pack req'd — aileron, rudder, elevator hinges
1/4"-20 nylon bolt, 2 req'd — wing hold-down
Goldberg 2.5" wide nylon tape, 22" req'd — wing center reinforcement
.030 clear plastic sheet, 3" x 8" req'd — windshield
Engine Mount to suit engine used, 1 req'd
4 or 6 oz. slant style fuel tank, 1 req'd
MonoKote, 2 rolls req'd
Williams Brothers 2⅝" pilot, 1 req'd
Tatone Instruments - 1/2" size, 1 set req'd
Epoxy clear and/or color dope for fuelproofing
RTV for wing-to-fuselage seal

happens to be the 3-point attitude, making you look like an expert on every landing. As with any taildragger, always hold full up elevator when taxiing.

Take-offs are easy — just gentle rudder input to steer, hold about 1/3 back stick and the Terrier will do a beautiful, smooth take-off every time. If you like the hot dog type, just let the tail come up, steer with the rudder until you are really moving, then haul the stick back and you are off! Remember, on this kind of climb-out to hold some right rudder — you will need it!

Aerobatic maneuvers of all kinds can be done with the Terrier. It will do the usual loops, rolls, spins, snap rolls, and hammerheads with ease and, with a little practice on your piloting technique, you will be doing 4-point rolls, tail slides, double snap rolls, snap on top of loops, square loops, and many others. Due to the Terrier's slow flying speed and low stall speed, you will be able to do all these maneuvers right in front of you! No more far away turnarounds setting up for the next maneuver. In addition to these maneuvers, you will be pleased to discover that the Terrier will also do a lot of outside maneuvers. Outside loops, outside snap rolls, outside loops with outside snaps, and inverted spins are all easily done with the Terrier. Spins and snaps, both inside and outside, can be stopped very easily merely by releasing the controls. Low and slow flying is easy, using a nose high attitude and 1/4 to 1/3 throttle! Slips, a difficult maneuver for many R/C aircraft, are also easily done with the Terrier simply by applying full rudder and then the appropriate amount of opposite aileron; altitude can be lost quickly and easily on final approach using this maneuver.

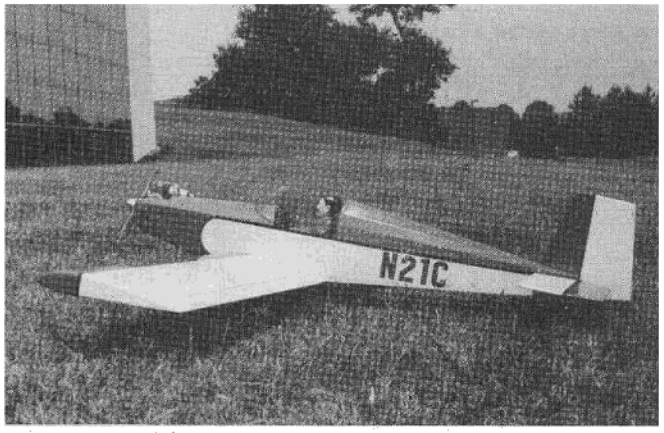
Keep in mind that all the above described maneuvers are done using a non-Schnuerle O.S. .25 in Huntsville, Alabama, which is about 700 feet MSL. For you folks at higher elevations, a Schnuerle .25 would be advisable, or maybe even a regular .35. I am sure that some of you out there would even think of installing a .40 but, please, not on this airplane! However, one type of .40 engine which would work great on the Terrier would be one of the .40 4-strokes. These are economical and the fantastic, quiet, scale-like sound would complement the scale-like looks of the Terrier. Two of the Terriers built in our club, the Rocket City Radio Controllers, are using 4-strokes — one an O.S. .40 and the other a Saito .45. I recommend that for 4-strokes you make a new firewall and move it back 3/4" and then lengthen the nose blocks to suit your engine. Even with the heavier engine weight, balance should be no problem, as I had all my radio gear located well-forward using the O.S. .25.

Structurally, the Terrier is lightweight, strong, and simple (I like easy to build structures), and with a little care in wood selection you should have no trouble coming out at around 55 oz. (using a relatively small radio, O.S. .25, and MonoKote finish). Almost anyone should be able to build the Terrier in a minimum amount of time using fast curing epoxies and cyanoacrylates. Even a beginner, with a little help, should be able to duplicate this model. As always, making a "kit" of parts first makes things easier later, so study the plans, cut out the parts for your "kit," and let's start building!

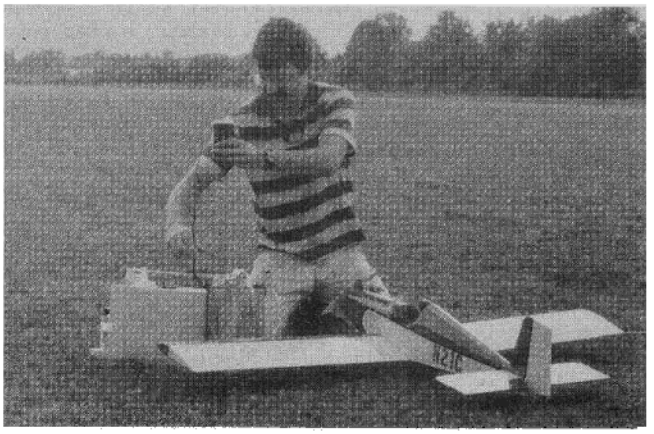
CONSTRUCTION

Fin And Rudder:

This is simple, so we will do it first to get into the swing of things. Shape the fin to the outline shown on the plans. The fin should be made from fairly hard balsa while the rudder should be made from medium density balsa. Add the cross-grain pieces to the top and bottom of the rudder using 5-minute epoxy and then cut the slots for the nylon hinges. Next, install the short piece of inner NyRod with nylon tape and cyanoacrylate to the bottom of the rudder. This engages the tailwheel wire and allows steering without any binding as well as being very strong. Round the edges of the fin and rudder and finish sanding overall with 320 or 400 paper.



The Terrier in its natural environment. Large diameter wheels permit operation from grass.

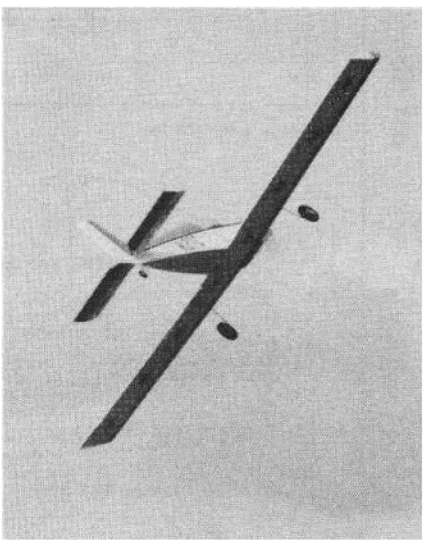


The author/designer preparing for another flight at Madison County Skypark near Huntsville, Alabama.

Stabilizer And Elevator:

These are built similar to the rudder. Use medium density balsa here. Glue on the cross-grain pieces to the ends of the stabilizer and the two elevator panels with 5-minute epoxy. Shape these pieces according to the plan and then install the 1/8" music wire elevator joiner. The best way to do this is to cut the slots into the elevator panels and then glue in the joiner using 5-minute epoxy with the elevator panels pinned down against the stabilizer (with waxpaper between the stabilizer and elevators). This will insure a good fit with no twist in the elevator panels. Do not be tempted to replace the 1/8" music wire joiner with one of smaller diameter because these elevator panels are quite large and can cause a smaller diameter joiner to twist which will cause your loops to lose track as well as affecting snap-roll performance. After everything is glued, cut the hinge slots and then round all edges. Finish sanding overall with 320 or 400 paper. One final point concerning the empennage — do not omit the cross-grain pieces. They are necessary to keep the tail surfaces stiff while under flight loads and also from warping due to covering shrinkage.

The Terrier on take-off.

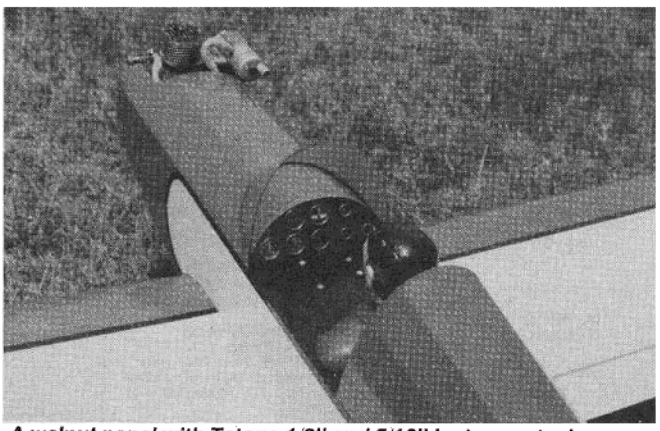


Nice view of the Terrier on a fly-by.

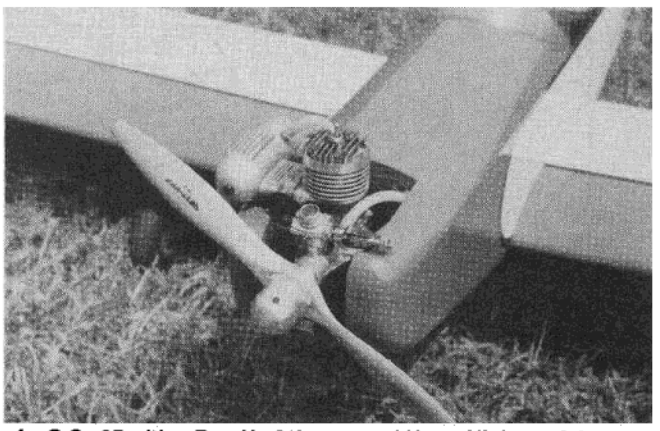
Wing:

All balsa wood in the wings should be fairly light except for the spar webs, which should be hard balsa. The first things to build are the landing gear mounting blocks (using 5-minute epoxy) as detailed on the plans. Then epoxy the 1/16" plywood doublers on ribs W3 and W4 for each wing; make sure these are on the correct side of their respective ribs. Next, cut the slot into both W1 ribs for the 1/4" diameter hold-down dowel. Now we are ready to start construction.

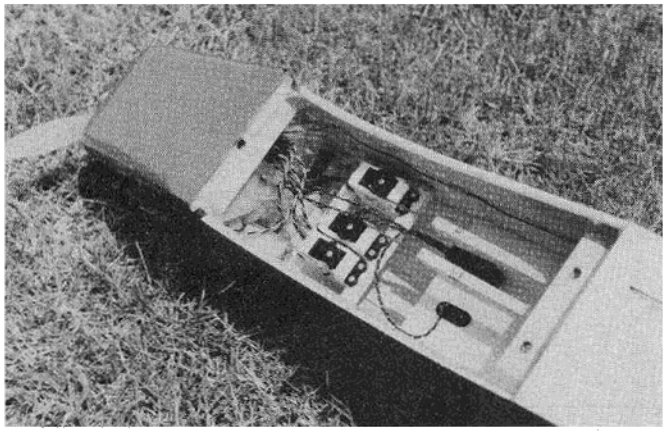
Pin down the lower trailing edge sheet and draw a reference line 3/16" from the rear edge; this line is where the back end of the ribs should be. Use pieces of left over 1/4" square spruce spar stock as shims under the lower spar (about four shims will do). Lay



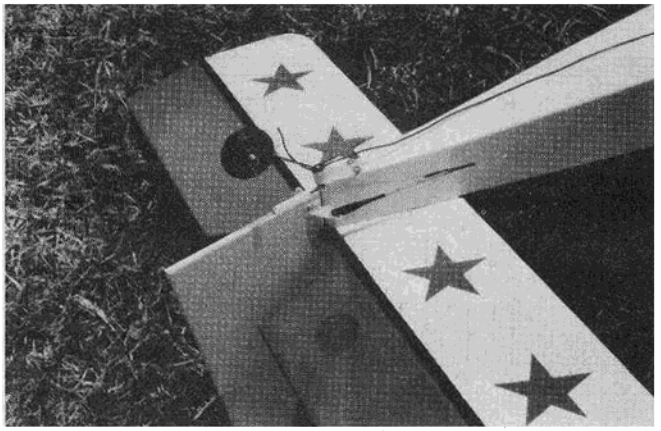
A walnut panel with Tatone 1/2" and 5/16" instruments dress up the cockpit. A Williams Brothers 2⅝" Sportsman Pilot completes the realism.



An O.S. .25 with a Rev-Up 9/4 prop and Harry Higley safety prop nut handle the propulsion duties.



Servo and pushrod installation are shown. Note switch and charging jack mounted in cockpit floor.

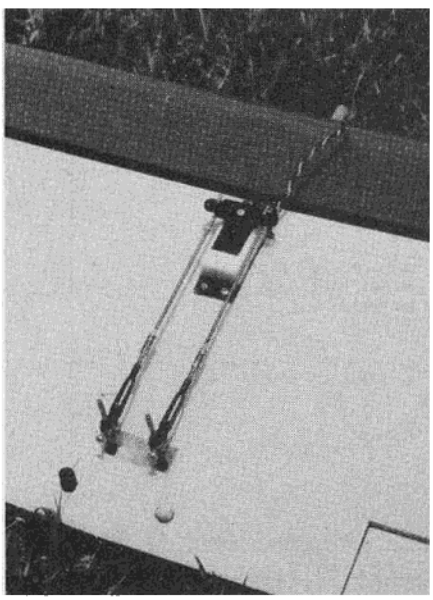


Tail wheel and rudder control arrangement can be seen in this photo.

the lower spar on the shims in its proper position and proceed to glue ribs W1 through W11 to the trailing edge and lower spar cap with Zap (or whatever cyanoacrylate you prefer). Do not forget to use the root rib dihedral angle gauge to get W1 glued at the proper angle. Next, glue in the spar webs with Zap, making sure to note the different thickness where shown on the plans. After gluing the webs check the top spar for a proper fit (sand the tops of the webs as necessary) and glue into place (use epoxy for this step to compensate for any gaps between webs and spar).

Now is the time to fit the 3/16" balsa trailing edge by beveling the lower edge with sandpaper for a good fit. Refer to the plans for the proper bevel and placement. After a good fit is achieved, Zap the trailing edge on and then install the top trailing edge sheet. Next, Zap the 1/4" square balsa leading edge into place and we are ready to install the landing gear mounting blocks.

First, remove the wing panel from the building board. Carefully study the proper position of the landing gear mounting blocks. Install the blocks with 5-minute epoxy, making sure to glue the long block to the lower spar cap as well as to the ribs. Epoxy in the three 1/4" triangular balsa reinforcements and the gear mount is completed.



Aileron control installation is straight forward.

Sheeting the D-tube is next. Before this step, the 1/4" square balsa leading edge must be sanded flush with the nose of the ribs on top and bottom (see wing cross section on plans). I used a razor plane followed up by a 10" to 12" long sanding bar for this step. After the leading edge has been trimmed, install the lower 1/16" balsa D-tube sheet using Zap. (When selecting D-tube sheeting, use the lightest wood for the bottom sheet). Remember the sheeting only covers half the spar cap as shown on the plans.

Before sheeting the top of the D-tube, locate the slot in the lower landing gear mounting block by running a 1/8" diameter drill through the vertical gear mounting block. Now cut out the lower 1/16" balsa sheet where the landing gear wire goes and you are ready to install the top D-tube sheet.

Pin the wing down securely on the building board with the 1/4" square shims under the lower spar. Assuming you have a flat building board we are now ready to install the top D-tube sheet. A good way to do this is as follows:

(1) Put Titebond on the edges of rib W2 through W10.

(2) Zap the back edge of the 1/16" balsa sheet to the top spar cap.

(3) Pull the sheet down snugly over rib W6 and Zap to the leading edge at this point.

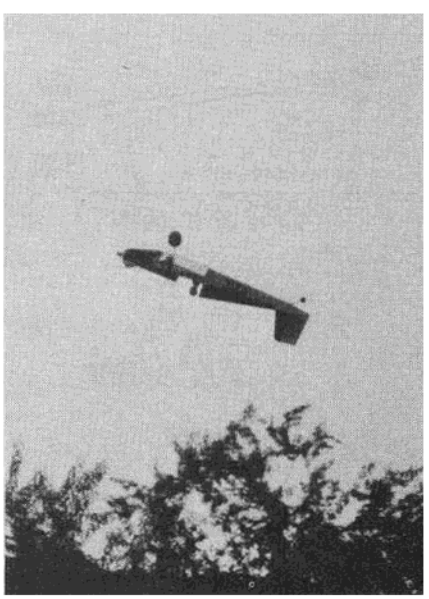
(4) Continue to pull the sheet down over each rib and Zap to the leading edge, working your way out to the root and tip (W5, W7 then W4, W8, etc.).

(5) Zap the sheet along the edge of W1 and W11 and then remove the wing from the board.

(6) Finish Zapping the sheet along the leading edge between all the ribs and the D-tube is complete with no pins required! At this time install the top and bottom 1/16" balsa sheeting from W1 to W4 and Zap the 1/4" wide capstrips to all the ribs.

The trailing edge stock should be cut from medium density 1/2" sheet balsa stock. I made mine from one sheet of 1/2" x 3" x 36" stock by cutting the sheet down the middle and using a razor plane and sandpaper to get the final shape. Some fellows have used a table saw and others a bandsaw to shape these pieces. Whatever works for you, be my guest. However, do not do any shaping on the front edge of the trailing edge stock at this point. After tapering the trailing edge stock per the plans, cut it into the two short pieces and the one long (aileron) piece for each wing as shown on the plans. Now go ahead and shape the front edge of the ailerons per the plans.

Bend up the aileron horns from 3/32" diameter music wire and don't forget to slide on the 1/8" O.D. brass



Terrier starting an outside loop.

tube before bending! Also, you need one left and one right horn. While you are at it, bend up one left and one right landing gear from 1/8" diameter music wire. I use a couple pair of Vise-Grips for these bending operations. You fellows with a bench vise will have an easier time of it.

Next, slot the inboard trailing edge piece for the aileron horn assembly and make some clearance for the horn to move fore and aft. Now, using 5-minute epoxy, carefully install the horn assembly into the trailing edge and glue the whole thing to the back of the wing checking to see that the proper airfoil shape is maintained. Also, at this time, glue on the outboard trailing edge piece using the aileron as a guide for proper positioning. While these are curing, drill the hole and make the slot in the aileron to fit the horn.

Sand the entire wing panel with medium grit sandpaper and then glue on and shape wing tip. Finish sanding the wing panel with 320 or 400 paper.

For the right wing panel use a little cooking oil on the plans to make them transparent and build on the opposite side. Repeat all the steps described to build the left panel. After both panels are complete, check their fit to make sure you have 2" total dihedral (1" under each tip). Sand the roots, if necessary, then epoxy the two panels together being careful not to get any twist. After the joint cures, use slow-cure epoxy to install the 2.5" wide nylon tape reinforcement around (top and bottom) the center joint. The 1/4" hold-down dowel will be installed later after match-drilling to F2.

Fuselage:

Glue the 1/16" balsa cross grain doublers to the fuselage sides using contact cement. Then Zap on the 1/4" balsa triangular pieces and 1/8" balsa stab doublers. Next, Zap F1 and F3 to the right fuselage side using a square to make sure they are perpendicular. Now turn both sides upside down on your building surface with F1 hanging over the edge and Zap F1 and F3 to the left side. Using 5-minute epoxy, install F2, F2A, and the 3/16" plywood wing mount. Next, set the wing into its proper position and drill the 1/4" hole into the wing using the hole in F2 as a guide (I sharpen the end of a 12" piece of 1/4" O.D. brass tube and use it as a drill bit). Also at this time, using 5-minute epoxy, install the 3/16" balsa cross grain sheeting on the bottom front of the fuselage and remove the wing.

Turn the fuselage over and install the 1/4" balsa triangular pieces at F2 and at the 3/16" plywood wing mount. Then glue in the plywood cockpit floor between the fuselage sides with Zap. Using 5-minute epoxy, install the 1/4" square balsa piece and triangular pieces under T1. Next, taper the aft ends of the 1/8" balsa stab doublers so the sides can be pulled together at the tail.

Mark the center of F1 and F3 with a pencil. Now draw a straight line across your building surface. Set the fuselage on the surface upside down again with F1 hanging over the edge and with the pencil marks over the line on the building surface; pin the fuselage down in this position. Now pull the sides together over the pencil line at the tail and glue together with 5-minute epoxy, making sure they are not twisted. After the epoxy cures, install the 3/32" balsa cross grain sheeting on the fuselage bottom aft of the wing with Zap. Also, use 5-minute epoxy and install the 3/32" plywood tailwheel bracket mount.

Remove the fuselage from the board and install the 1/4" square balsa pieces under T4 and T5 with 5-minute epoxy. Now, using Zap, install formers T1-T6 as shown on the plans. Next, glue in the top center 3/32" x 3/16" spruce turtleback stringer with 5-minute epoxy and then install three more on either side, spacing them as shown on the plans.

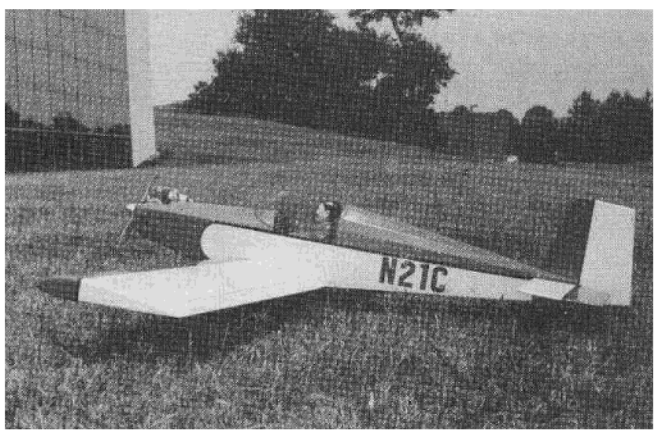
Make the front turtledeck cover by edge gluing two 3" wide pieces of 1/8" balsa. Cut the sheet slightly oversize and then carefully trim and/or sand the edges for a good fit. Install with Zap and use micro-balloons and Zap to fill any small gaps at the edges. Glue the soft balsa blocks and 1¼" T.E. stock pieces into the nose with 5-minute epoxy as shown on the plans. Note that the left and right nose blocks are different. Also, at this time, install the 1/4" hold-down dowel into the wing, using epoxy. After curing, place the wing on the fuselage, check alignment, and drill and tap the holes for the 1/4-20 bolts. Carve the nose to the shape shown on the plans and sand the fuselage overall with medium grit paper. Finish sand with 320 or 400 paper. Also, at this time, cut the soft balsa fairing blocks aft of T6 and sand to shape.

Cover and Finish:

I prefer MonoKote for its light weight and quick application. Before covering you should apply two coats of Hobbypoxy clear dope or equivalent, to the nose area and around the area where the wing rests; this is for fuelproofing. Then cover each assembly (wing, fuselage, tail) individually with your choice of colors. After covering is complete, glue on the tail and fairing blocks using 5-minute epoxy. Remember to cut away the MonoKote at the glue joints. Refer to the plans for the installation of the windshield. Don't omit the cut-off straight pins at the lower corners as these add a lot of strength in holding the windshield on. Run a piece of 1/4" wide striping tape around the windshield/fuselage joint to simulate a canopy frame.

Install the landing gear and tailwheel hardware and make sure main wheels are lined up properly (no camber or toe-in). Then install the throttle cable and housing, engine mount, fuel tank, engine and muffler, and prop. At this time verify that the wing incidence is correct (0 degrees) and then cover the center section of the wing with several strips of MonoKote backing (the clear stuff you remove before use). Now apply RTV to the fuselage opening and install the wing, tightening the nylon bolts snugly. After the RTV has cured, remove the wing and trim off the excess RTV with a sharp razor blade. You now have a perfect seal against fuel and oil.

The pilot I used was a Williams Brothers 2⅝" Sportsman figure painted with PLA enamel (the kind used for plastic display models) which is completely fuelproof. Credit for the painting of the pilot goes to my wife, Kim, who did a much better job than I could have done! The pilot is installed with RTV and, in addition, has two #3



screws installed from inside the fuselage into a piece of 1/8" plywood which I installed inside the pilot when I glued him together.

I used balsa wood stained with walnut stain for the instrument panel, and the instruments are made by Tatone. I also stained the former directly behind the pilot's head with walnut stain. Interestingly, everyone thinks I have used real walnut! (I fuelproofed the panel and former with clear Hobbypoxy.)

Set Up and Flying:

If you use a standard O.S. .25 engine you will need to keep your radio gear well-forward. My receiver and battery are under the fuel tank and the servos are in the forward part of the radio compartment. No weight was required to obtain the proper C.G. I used 1/4" square spruce for pushrods, but the NyRod type will work equally as well.

After all your gear is installed including landing gear, pilot, prop, etc., check the C.G. Move the radio gear or add weight to get the C.G. location shown on the plans. Control throws should be as close as possible to those shown on the plans for optimum aerobatic performance. If you are inexperienced, or aren't inclined towards wild aerobatics, then reduce the throws shown by 40% to 50%. The best prop is a 9/4 for the standard O.S. .25. The Rev-Up or Zinger props seem to work best. For the .40 4-stroke engines, diameters of 11"-12" and pitches of 6"-7" will put you in the ballpark.

As far as flying is concerned, the Terrier is very docile and quite easy to handle. When flying very slow it is advisable to use rudder along with ailerons to counteract the adverse yaw from the ailerons. (This results from the high drag of the wing with the down aileron, which causes the plane to turn opposite the direction you want to go. Its effect is more pronounced at slower airspeeds.) Take-offs are done by applying full throttle, holding about 1/3 up elevator, and steering with rudder as needed. Snap rolls are best done using ailerons, rudder, and elevator, although they can be done with only rudder and elevator. Spins look best using only rudder and elevator (and low throttle, of course), but can be done faster using ailerons, rudder, and elevator. Also, remember that when flying upside down and doing inverted maneuvers, your stall speed is higher than it would be if you were flying upright. Landings can be either three-point or wheel landings — both are easy to do. I won't go into aerobatic maneuvers since these were described in detail in the first part of the article. If you intend to fly off grass, I suggest you go to 3½" Trexler Air Wheels and a Schnuerle .25.

After a few hours time with the Terrier, I think you will find that it is one of the most fun to fly aircraft you have ever flown; I know that I have. If you have comments or questions, feel free to write me in care of RCM (please send an S.A.S.E.) Have fun! □

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